



COUNTY OF GALVESTON
SPECIFICATIONS AND CONTRACT DOCUMENTS

Daniel Dror Avenue
Bid # B211031



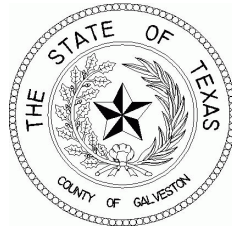
07-06-2021

July 6, 2021

CONTENTS

Invitation to Bid – General Provisions.....	1
Special Provisions – Attachments A & B.....	39
Prohibition on Contracts with Companies Boycotting Israel.....	88
Prohibition on Contracts with Certain Companies.....	89
Certification Regarding Lobbying	90
Non-Collusion Affidavit	91
Bid Forms.....	92
Acknowledgment and Certification Regarding Debarment.....	95
Vendor Qualification Packet.....	96
Special Provisions for Construction.....	107
Prevailing Wage Rate.....	123
Bid Proposal.....	128
Contract Award.....	134
Affidavit and Surety Forms.....	137
Specifications.....	141
Plans.....	Separate Document

**GALVESTON COUNTY
PURCHASING DEPARTMENT**



INVITATION TO BID

ITB #B211031

DANIEL DROR AVENUE

BID DUE DATE: 8/12/2021

2:15 P.M. CST

***Rufus Crowder, CPPO, CPPB
Purchasing Agent
Galveston County
722 Moody (21st Street)
Fifth (5th) Floor
Galveston, Texas 77550
(409) 770-5372***



INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

Sealed bid in sets of three (3), one (1) unbound original and two (2) copies will be received in the office of the County Purchasing Agent until **2:15 P.M. CST, on Thursday, August 12, 2021** and opened immediately in that office in the presence of the Galveston County Auditor and the Purchasing Agent. Sealed bids are to be delivered to Rufus G. Crowder, CPPO CPPB, Galveston County Purchasing Agent at the Galveston County Courthouse, 722 Moody (21st Street), Floor 5, Purchasing, Galveston, Texas 77550, (409) 770-5372. **The time stamp clock located in the Purchasing Agent's office shall serve as the official time keeping piece for this solicitation process. Any bid received after 2:15 P.M. CST on the specified date will be returned unopened.**

Purpose:

Galveston County is seeking a vendor to construct a two-lane road consisting of concrete paving, ADA ramps, sidewalks, roadside ditches, storm sewer, pavement markings, traffic control, traffic signage, and a traffic signal. The limits are from Hanson Road in Clear Lake Shores, Texas to FM 518 in Kemah, Texas.

All bids must be marked on the outside of the envelope:

ITB #B211031, Daniel Dror Avenue

Bids name and return address, should be prominently displayed on the bid package for identification purposes.

Bid Specifications can be obtained by visiting the Galveston County website @

<http://www1.galvestoncountytx.gov/pu/Pages/OpenSolicitations.aspx>

Bid prices shall be either lump sum or unit prices as shown on the bid sheet, if applicable. The net price will be delivered to Galveston County, including all freight, shipping, and license fees. Galveston County is tax exempt and no taxes should be included in your bid pricing.

A non-mandatory pre-bid conference will be held on Tuesday, July 27, 2021 at 11:00 a.m.

Potential vendors can choose either a virtual pre-bid conference or an in person pre-bid conference. Instructions for both are listed below:

Virtual Pre-Bid Conference:

Due to the COVID-19 pandemic, the County of Galveston has instituted measures to guard against the spread of the virus. This includes the prohibition of in-person meetings, social distancing, and stay-at-home requirements for employees.

The Pre-Bid Conference shall take place via video/tele-conference and the instructions are listed below and on the County's Purchasing website:

Minimum System Requirements for Video Conferencing:

1. High-resolution webcam;
2. Computer processing minimum: 2 GB of RAM and a quad-core processor;
3. Network bandwidth: 1 Mbps is sufficient for 15 fps at 720p resolution;

Calling from a mobile device:

1. Front facing camera;
2. In ear headphone with built in mic

Instructions for Video Conferencing:

1. [Click here](#) or navigate to <https://guest.lifesize.com/1907077>
2. **Enter attendee name, attendee company name, and email address (for contact and addenda issuance purposes)**
3. Click the Terms of Service and Privacy Policy checkbox;
4. Click Join Meeting

***Note - be sure to enable audio and video.**

In-Person Pre-Bid Conference:

A non-mandatory pre-bid conference will be held on **Tuesday, July 27, 2021 at 11:00 a.m.** at the Galveston County Courthouse, Purchasing Department, 722 Moody (21st Street), Fifth (5th) Floor, Galveston, Texas 77550.

Copies of bid/Contract Documents may also be obtained from www.Civcast.com search Galveston County Daniel Dror Avenue. Proposers must register on this website in order to view and/or download specifications and plans for this project. There is NO charge to view or download documents. If copies of the proposing documents are to be mailed, please contact HR Green at 713.965.9996 for postage and handling. Return of documents is not required and no refund will be granted.

Upon satisfaction of contractual terms (e.g., goods delivered in promised condition, services rendered as agreed, etc.), contractor shall be paid via Galveston County's normal accounts payable process.

Bonding Requirements:

- **BID GUARANTEE:** Evidencing its firm commitment to engage in the contract if Proposer is selected for award of contract, each Proposer is required to furnish with their bid a Cashier's Check, or an acceptable Proposer's Bond, in the amount of five percent (5%) of the total contract price. The Proposer's Bond must be executed with a surety company authorized to do business in the State of Texas. Failure to furnish the bid/bid guarantee in the proper form and amount, by the time set for opening of bids may be cause or rejection of the bid.
- **PERFORMANCE AND PAYMENT BONDS:** Successful proposer, before beginning work, shall execute a performance bond and a payment bond, each of which must be in the amount of the contract. The required payment and performance bonds must each be executed by a corporate surety in accordance with Section 1, Chapter 87, Acts of the 56th Legislature, Regular Session, 1959 (Article 7.19-1, Vernon's Texas Insurance Code).

Attention is called to the fact that not less than, the federally determined prevailing (Davis-Bacon and Related Acts) wage rate, as issued by the Office of Rural Community Affairs and contained in the contract documents, must be paid on this project. In addition, the successful proposer must ensure that employees and applicants for employment are not discriminated against because of race, color, religion, sex age or national origin.

The Galveston County Commissioners' Court reserves the right to waive any informality and to reject any and all bids and to accept the bid or bids which, in its opinion, is most advantageous to Galveston County with total respect the governing laws.

All contractors/subcontractors that are debarred, suspended or otherwise excluded from or ineligible for participation on federal assistance programs may not undertake any activity in part or in full under this project

Rufus G. Crowder, CPPO CPPB
Purchasing Agent
Galveston County

**INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

Table of Contents

GENERAL PROVISIONS:

1.	BID PACKAGE.....	1
2.	BIDDER’S RESPONSIBILITY	1
3.	TIME FOR RECEIVING BIDS	1
4.	COMPETITIVENESS, INTEGRITY, INQUIRIES AND QUESTIONS	2
5.	BID OPENING	3
6.	WITHDRAWAL OF BID/FIRM BID RULE.....	3
7.	COMMISSIONERS’ COURT	3
8.	REJECTION OF BIDS/DISQUALIFICATION.....	3
9.	RESTRICTIVE OR AMBIGUOUS SPECIFICATIONS.....	4
10.	SUBSTITUTES/DESCRIPTION OF MATERIALS AND EQUIPMENT	4
11.	EXCEPTIONS TO BID	4
12.	PRICING.....	4
13.	PROCUREMENT CARD (P-CARD) PROGRAM.....	5
14.	PASS THROUGH COST ADJUSTMENTS	5
15.	MODIFICATION OF BIDS	5
16.	PRE-BID CONFERENCE	5
17.	SIGNATURE OF BIDS.....	6
18.	AWARD OF BIDS – EVALUATION CRITERIA AND FACTORS	6
19.	DISPUTE AFTER AWARD/PROTEST	7
20.	PUBLIC INFORMATION ACT (f/k/a Open Records Act).....	7
21.	BIDDER’S E-MAIL ADDRESSES – CONSENT TO DISCLOSURE	8
22.	RESULTANT CONTRACT.....	8
23.	CONTRACT TERM.....	8
24.	TERMINATION FOR DEFAULT	8
25.	TERMINATION FOR CONVENIENCE.....	9
26.	FORCE MAJEURE	9

**INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

27.	ESTIMATED QUANTITIES	9
28.	CONTRACTOR INVESTIGATION.....	9
29.	NO COMMITMENT BY COUNTY OF GALVESTON.....	10
30.	BID COSTS BORNE BY PROPOSER.....	10
31.	BEST AND FINAL OFFERS (BAFO)	10
32.	SINGLE BID RESPONSE.....	10
33.	CHANGES IN SPECIFICATIONS.....	10
34.	BID IDEAS AND CONCEPTS.....	11
35.	BID DISCLOSURES	11
36.	INDEMNIFICATION.....	11
37.	REQUIREMENT OF AND PROOF OF INSURANCE	11
38.	BID GUARANTEE	13
39.	PERFORMANCE AND PAYMENT BONDS (if required)	13
40.	PATENT AND COPYRIGHT PROTECTION	14
41.	CONFLICT OF INTEREST DISCLOSURE REPORTING (FORM CIQ)	14
42.	DISCLOSURE OF INTERESTED PARTIES/FORM 1295	15
43.	CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS & REQUIREMENT TO REGISTER IN SAM.....	16
44.	TRANSACTIONS WITH TERRORIST ORGANIZATIONS PROHIBITED.....	17
45.	VERIFICATION NOT TO BOYCOTT ISRAEL	18
46.	SOVEREIGN IMMUNITY	18
47.	CONTROLLING LAW AND VENUE.....	19
48.	MERGERS, ACQUISITIONS.....	19
49.	DELAYS.....	19
50.	ACCURACY OF DATA	19
51.	SUBCONTRACTING/ASSIGNMENT	19
52.	INDEPENDENT CONTRACTOR.....	19
53.	MONITORING PERFORMANCE	19
54.	SUBJECT TO APPROPRIATION OF FUNDS.....	19
55.	CONTRACTS SUBJECT TO GRANT FUNDING	20
56.	PROCUREMENT ETHICS	20

**INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

57.	NON-COLLUSION AFFIDAVIT	22
58.	CERTIFICATION REGARDING LOBBYING	23
59.	NON-DISCRIMINATION	24
60.	RECORD RETENTION AND RIGHT TO AUDIT	25
61.	TITLE VI ASSURANCES/TXDOT	25
62.	SECTION 231.006, FAMILY CODE/DELINQUENT CHILD SUPPORT	25
63.	ANTITRUST	25
64.	LABOR STANDARDS	25
65.	PROCUREMENT LAWS.....	26
66.	ENERGY EFFICIENCY (42 U.S.C. 6201 AND 2 CFR 200 APPENDIX II (H))	30
67.	LEAD AND ASBESTOS	31
68.	USE OF DHS SEAL, LOGO, AND FLAGS PROHIBITED WITHOUT PRIOR APPROVAL.....	31
69.	FEDERAL GOVERNMENT NOT A PARTY.....	30
70.	PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS.....	31
71.	ACKNOWLEDGMENT OF GOVERNMENT RECORD.....	31
72.	COMPLIANCE WITH GALVESTON CUNTY PURCHASING POLICIES AND PROCEDURES.....	31
73.	ENTIRETY OF AGREEMENT AND MODIFICATION.....	31
74.	NOTICE.....	32

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

1. BID PACKAGE

*The Invitation to Bid, general and special provisions, drawings, specifications/line item details, contract documents, addenda (if any), and the Bid are all part of the Bid package. **BIDS must be submitted in sets of three (3), one (1) unbound original, and two (2) copies** on the forms provided by the County if County forms are provided, and shall include the Bid sheets completed in their entirety and signed by an authorized representative by original signature. Failure to complete and sign the Bid sheets/contract page(s) may disqualify the Bid from being considered by the Commissioners' Court. Any individual signing on behalf of the Proposer expressly affirms that he or she is duly authorized to tender this Bid and to sign the Bid under the terms and conditions in this Invitation to Bid on behalf of the Proposer and to bind the Proposer to the terms and conditions of this Invitation to Bid and the Bidder's response hereto. Proposer further understands that Proposers' signing of the contract shall be of no effect unless the contract is subsequently awarded by the Commissioners' Court and the contract properly executed by the Commissioners' Court. All figures must be written in ink or typed. Figures written in pencil or with erasures are not acceptable. However, mistakes may be crossed out, corrections inserted, and initialed in ink by the individual signing the bid. If there are discrepancies between unit prices quoted and extensions, the unit price shall prevail. Each Proposer is required to thoroughly review this entire Invitation to Bid package to familiarize themselves with the Bid procedures, the plans and specifications for the requested work, as well as the terms and conditions of the contract the successful Proposer will execute with the County.*

2. BIDDER'S RESPONSIBILITY

The Proposer must affirmatively demonstrate its responsibility. The Proposer must also meet the following minimum requirements:

- A. have adequate financial resources or the ability to obtain such resources as required;
- B. be able to comply with all federal, state, and local laws, rules, regulations, ordinances and orders regarding this Invitation to Bid;
- C. have a satisfactory record of performance;
- D. have a satisfactory record of integrity and ethics; and
- E. be otherwise qualified and eligible to receive an award.

3. TIME FOR RECEIVING BIDS

Bids may be submitted by mail or hand delivery and **must be submitted only to the Galveston County Purchasing Agent**. If by delivery, the Proposer must deliver the Bid to the reception desk in the County Purchasing Agent's Office. The delivery and mailing instructions for the Galveston County Purchasing Agent are the following:

**Rufus Crowder, CPPO CPPB
Galveston County Purchasing Agent
722 Moody, Fifth (5th) Floor
Galveston, Texas 77550**

Bids will **not** be accepted by facsimile transmission or by electronic mail (email) unless superseded by instructions within the Special Provisions sections of this solicitation. Bids must be received by the County Purchasing Agent on or before the deadline for the opening of the Bids. For clarity, mailing date/postmark is **not** sufficient – Bids **must be received** by the County Purchasing Agent on or before the deadline. Late Bids will not be accepted and will be returned to the proposer unopened. Bids received prior to the submission deadline will be maintained unopened until the specified time for opening.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

The County Purchasing Agent will accept Bids from 8:00 a.m. to 5:00 p.m. on each business day up to the submission deadline. Business days do not include Saturdays and Sundays, and do not include other days in which the County is closed for business in observance of holidays or for other reasons.

The time-stamp clock within the County Purchasing Agent's Office shall be the official time-clock for the purpose of this solicitation and thus shall be the determinant of whether the Bid was timely received.

The proposer should prominently identify the procurement number and name on the outside of the envelope/ mailing package. A label shall be provided for this purpose and usage of the label is preferred. If the proposer fails to identify the Invitation to Bid number and name on the outside of the envelope as required, the Purchasing Agent will open the envelope for the sole purpose of identifying the solicitation number for which the submission was made. The envelope will then be resealed. No liability will attach to a County office or employee for the premature opening of a Bid.

If a Bid is not submitted, return this Invitation to Bid and state reason (s), otherwise your name may be removed from the Purchasing Agent's mailing list.

4. COMPETITIVENESS, INTEGRITY, INQUIRIES AND QUESTIONS

To prevent biased evaluations and to preserve the competitiveness and integrity of the procurement process, **proposers are to direct all communications regarding this invitation to bid only to the Galveston County Purchasing Agent**, unless otherwise specifically noted.

Do not contact the requesting department. Attempts by offering firms to circumvent this requirement will be viewed negatively and may result in rejection of the Bid of the firm found to be in non-compliance.

All questions regarding this Invitation to Bid must be submitted in writing to:

**Rufus Crowder, CPPO CPPB, Purchasing Agent
722 Moody
Fifth (5th) Floor
Galveston, Texas 77550
Fax: (409) 621-7997
E-mail: purchasing.bids@co.galveston.tx.us**

All questions received and the responses thereto will be mailed, emailed, or faxed to all prospective proposers by addendum. No inquiries except clarification of instructions will be addressed by telephone.

Proposer is advised to carefully review this Invitation to Bid – it provides specific information necessary to aid participating firms in formulating a thorough response. Bidder's failure to examine all documents shall not entitle the proposer to any relief from the conditions imposing in the Invitation to Bid and the resultant contract.

An authorized person from the proposer must sign the Bid. This signatory must be a person from the submitting firm who is duly authorized to tender and sign the Bid on behalf of the proposer and to bind the proposer to the terms and conditions of this Invitation to Bid, the Bidder's response, and all other terms and conditions of the contract. By this signature, the proposer further acknowledges that the proposer has read the Invitation to Bid and Bid documents thoroughly before submitting a Bid and will fulfill the obligations in accordance to the terms, conditions, and specifications detailed herein.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

5. BID OPENING

The Purchasing Agent shall open the Bids on the date and time specified herein. Only the names of the proposers will be read at the opening. Bids shall be opened in a manner that avoids disclosure of the contents to competing offerors and that keeps the Bids secret during negotiations. The Purchasing Agent will examine Bids promptly and thoroughly. Upon opening, no Bid may be withdrawn for a period of sixty (60) calendar days after the Bid opening date.

6. WITHDRAWAL OF BID/FIRM BID RULE

Proposers may request withdrawal of their sealed Bid prior to the scheduled Bid opening time provided the request for withdrawal is submitted to the Purchasing Agent in writing. No Bids may be withdrawn for a period of sixty (60) calendar days after opening of the Bids.

7. COMMISSIONERS' COURT

No contract is binding on the County until it is properly placed on the Commissioners' Court agenda, approved in open Court, authorized to be executed by the County Judge, and fully executed by both parties.

Department heads and elected officials are not authorized to enter into any type of agreement or contract on behalf of the County. Only the Commissioners' Court acting as a body may enter into a contract on behalf of and contractually bind the County. Additionally, department heads and elected officials are not authorized to agree to any type of supplemental agreements or contracts for goods or services. Supplemental agreements are subject to review by the County Legal Department prior to being accepted and signed by the County's authorized representative.

8. REJECTION OF BIDS/DISQUALIFICATION

Galveston County, acting through its Commissioners' Court, reserves the right to:

- reject any and all Bids in whole or in part received by reason of this Invitation to Bid;
- waive any informality in the Bids received;
- disregard the Bid of any proposer determined to be not responsible;
- disregard the Bid of any proposer determined to have not submitted its Bid timely; and/or
- discontinue its efforts for any reason under this Invitation to Bid package at any time prior to actual execution of contract by the County.

Proposers may be disqualified and rejection of Bids may be recommended to the Commissioners' Court for any of (but not limited to) the following causes:

- A. Failure to use the Bid forms furnished by the County, if applicable;
- B. Lack of signature by an authorized representative of proposer;
- C. Failure to properly complete the Bid;
- D. Engaging in communications regarding this procurement during the pendency of this procurement with County officials and/or personnel who are not within the Purchasing Agent's Office;
- E. Failure to meet the mandatory requirements of this Invitation to Bid; and/or
- F. Evidence of collusion among proposers.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

9. RESTRICTIVE OR AMBIGUOUS SPECIFICATIONS

It is the responsibility of the prospective proposer to review the entire Invitation to Bid packet and to notify the Purchasing Agent if the specifications are formulated in a manner that would restrict competition or appear ambiguous. Any protest or question(s) regarding the specifications or Bid procedures must be received in the Purchasing Agent's Office not less than seventy-two (72) hours prior to the time set for Bid opening. Proposers are to submit their Bid as specified herein or propose an approved equal.

10. SUBSTITUTES/DESCRIPTION OF MATERIALS AND EQUIPMENT

Any brand name or manufacturer reference used herein is intended to be descriptive and not restrictive, unless otherwise noted, and is used to indicate the type and quality of material. The term "or equal" if used, identifies commercially produced items that have the essential performance and salient characteristics of the brand name stated in the item description. All supplies, material, or equipment shall be new and of the most suitable grade for the purpose intended. For clarification, "new" includes products containing recovered materials that are EPA-designated items and additionally see Section 63 of these General Provisions on contracts involving federal funds. It is not the County's intent to discriminate against any materials or equipment of equal merit to those specified. However, if proposer desires to use any substitutions, prior written approval must be obtained from the Purchasing Agent and sufficiently in advance such that an addendum may be issued. All material supplied must be one hundred percent (100%) asbestos free. Proposer, by submission of its Bid, certifies that if awarded any portion of this procurement, the proposer will supply only material and equipment that is 100% asbestos free.

11. EXCEPTIONS TO BID

The proposer will list on a separate sheet of paper any exceptions to the conditions of this Invitation to Bid.

This sheet will be labeled, "Exceptions to Bid Conditions", and will be attached to the Bid. If no exceptions are stated, it will be understood that all general and special conditions will be complied with, without exception.

The proposer must specify in its Bid any alternatives it wishes to propose for consideration by the County. Each alternative should be sufficiently described and labeled within the Bid and should indicate its possible or actual advantage to the program being offered.

The County reserves the right to offer these alternatives to other proposers.

12. PRICING

Bids will be either lump sum or unit prices as shown on the Bid sheet. The net priced items will be delivered to Galveston County, including all freight, shipping, and delivery charges.

Cash discount must be shown on the Bid, otherwise prices will be considered net. Unless prices and all information requested are complete, the Bid may be disregarded and given no consideration.

In case of default by the contractor, the County of Galveston may procure the articles or services from other sources and may deduct from any monies due, or that may thereafter become due to the contractor, the difference between the price named in the contract of purchase order and the actual cost thereof to the County of Galveston. Prices paid by the County of Galveston shall be considered the prevailing market price at the time such purchase is made. Periods of performance may be extended if the facts as to the cause of delay justify such extension in the opinion of the Purchasing Agent and the Commissioners' Court.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

13. PROCUREMENT CARD (P-CARD) PROGRAM

The County of Galveston participates in a Procurement Card (P-Card) program that allows payments made to a vendor by credit card. This method typically results in substantially faster bill payments, sometimes within three (3) to five (5) days of the actual transaction date. All transaction fees from the card provider are to be paid by the successful contractor. If awarded company will accept payment via credit card (Visa, MasterCard), this should be notated in the Bid submittal.

14. PASS THROUGH COST ADJUSTMENTS

Except in instances of extreme extenuating circumstances, Contractor prices shall remain firm throughout the contract period and any renewals. Examples of extreme extenuating circumstances include such situations as a nationwide rail strike, oil shortage or oil embargo.

In extreme extenuating circumstances, Contractors may be allowed to temporarily “pass through” additional costs they are forced to incur through no fault of their own. A request for a pass-through cost increase will not be considered unless a Contractor’s cost for the Contractor’s product exceeds 10% over the original cost for the product. Also, the increase in cost must be nationwide and consistent for a minimum period of sixty (60) calendar days. Costs that historically are anticipated to rise over a period of time (for example only, such as wages or insurance costs) do not qualify for pass through. If a Contractor thinks he will be asking for a pass-through cost adjustment during the term of the contract, then the original cost of the product to Contractor must be stated in Contractor’s original Bid.

A request for a pass-through cost does not guarantee that one will be granted. Contractors must submit such information on each request as required by the County Purchasing Agent. The County Purchasing Agent will review each request on a case-by-case basis and if valid submit the request to the Commissioners’ Court for authorization and determination of the appropriateness of each request as well as amount and duration of increase. Contractors will not be permitted any additional compensation for mark-ups or profits based on the increase in price. Rather, such additional compensation will be limited to the actual increase in original cost to the Contractor as such increase is reflected by the original cost stated in the bid. But in no event will the amount of additional compensation exceed 25% increase in Contractor’s original cost for the product as such cost is reflected in Contractor’s original Bid or the duration exceed a period of sixty (60) calendar days. In addition, should the cost, during the period of the pass through, return to normal or decrease to below pre pass through prices, appropriate downward adjustments shall be made. No more than one pass through adjustment will be permitted per year.

15. MODIFICATION OF BIDS

A proposer may modify a Bid by letter at any time prior to the submission deadline for receipt of Bids. Modification requests must be received by the Purchasing Agent prior to the submission deadline. Modifications made before opening time must be initialed by proposer guaranteeing authenticity. Bids may not be amended or altered after the official opening with the single exception that any product literature and/or supporting data required by the actual specifications, if any, will be accepted at any time prior to the Commissioners’ Court considering of same.

16. PRE-BID CONFERENCE

A pre-Bid conference for the purpose of discussing contract requirements and answering questions of prospective proposers may be conducted in this procurement. A pre-Bid conference may be mandatory or voluntary. If the pre-Bid conference is mandatory, then the County is authorized to condition acceptance of a Bid on compliance with attendance. The Special Provisions of this procurement shall specify if a pre-Bid conference is to be held and shall specify whether the pre-Bid conference is mandatory or voluntary. Regardless of whether the pre-Bid conference is mandatory or voluntary, only a principal, officer, or employee of the proposer may represent the proposer at the pre-Bid conference and no person may represent more than one proposer at the pre-Bid conference.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

17. SIGNATURE OF BIDS

Each Bid shall give the complete name of the proposer and the mailing address of the proposer and be signed by an authorized representative by original signature with the authorized representative's name and legal title typed below the signature line. Each Bid shall include the Bidder's Federal Employer Identification Number (FEIN). Failure to sign the Contract page(s) and Bid response sheets may disqualify the Bid from being considered by the County. The person signing on behalf of the proposer expressly affirms that the person is duly authorized to tender the Bid on behalf of the proposer and to sign the Bid sheets and contract under the terms and conditions of this Invitation to Bid and to bind the proposer hereto and further understands that the signing of the contract shall be of no effect until it is properly placed on the Commissioners' Court agenda, approved in open Court, authorized to be executed by the County Judge, and fully executed by both parties.

18. AWARD OF BIDS – EVALUATION CRITERIA AND FACTORS

The award will be made to the responsible proposer whose Bid is determined to be the lowest and best evaluated offer demonstrating the best ability to fulfill the requirements set forth in this Invitation to Bid. **The proposed cost to the County will be considered firm and cannot be altered after the submission deadline, unless the County invokes its right to request a best and final offer.**

"Lowest and best" means a bid or offer providing the best value considering associated direct and indirect costs, including transport, maintenance, reliability, life cycle, warranties, and customer service after a sale.

In determining the lowest and best bid for a contract for the purchase of earth-moving, material-handling, road maintenance, or construction equipment, the Commissioners' Court may also consider the information submitted under Section 262.0255 of the Local Government Code; and in determining the lowest and best bid for a contract for the purchase of road construction material, the Commissioners' Court may consider the pickup and delivery locations of the bidders and the cost to the county of delivering or hauling the material to be purchased. The Commissioners' Court may award contracts for the purchase of road construction material to more than one bidder if each of the selected bidders submits the lowest and best bid for a particular location or type of material.

Each proposer, by submitting a Bid, agrees that if its' Bid is accepted by the Commissioners' Court, the proposer will furnish all items and services upon which prices have been tendered and upon the terms and conditions in this Bid, including but not limited to the best and final offer if applicable, and the contract.

The contractor shall commence work only after the transmittal of a fully executed contract and after receiving written notification to proceed from the County Purchasing Agent. The contractor will perform all services indicated in the Bid in compliance with this contract.

Neither department heads nor elected officials are authorized to sign any binding contracts or agreements prior to being properly placed on the Commissioners' Court agenda and approved in open court. Department heads and other elected officials are not authorized to enter into any type of agreement or contract on behalf of Galveston County. Only the Commissioners' Court, acting as a body, may enter into a contract on behalf of the County. Additionally, department heads and other elected officials are not authorized to agree to any type of supplemental agreements or contracts for goods or services. Supplemental agreements are subject to review by the County Legal Department prior to being signed by the County's authorized representatives.

The County of Galveston reserves the right to accept Bids on individual items listed, or group items, or on the Bid as a whole; to reject any and all Bids; to waive any informality in the Bids; to disregard Bids that are not submitted timely; to disregard the Bids of proposers determined to be not responsible; and to accept the Bid that appears to be in the best interest of the County. The selection process may, however, include a request for additional information or an oral presentation to support the written Bid.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

In determining and evaluating the best Bid, the pricing component may not necessarily be controlling, but quality, equality, efficiency, utility, general terms, delivery, suitability of the service offered, and the reputation of the service in general use will also be considered along with any other relevant items.

The County reserves the right to reject any or all Bids in whole or in part received by reason of this Invitation to Bid and may discontinue its efforts under this Invitation to Bid for any reason or no reason or solely for the County's convenience at any time prior to actual execution of the contract by the County.

A Proposer whose Bid does not meet the mandatory requirements set forth in this Invitation to Bid will be considered non-compliant.

The invitation to submit a Bid which appears in the newspaper, or other authorized advertising mediums, these general provisions, the special specifications which follow, the Bid sheets, forms, and any addenda issued are all considered part of the Bid.

Each proposer, by submitting a Bid, agrees that if its Bid is accepted by the Commissioners' Court, such proposer will furnish all items and services upon the terms and conditions in this Invitation to Bid and the resultant contract.

Notice of contract award is anticipated to be made within ninety (90) days of opening of Bids to the lowest responsive and responsible contractor, whose Bid complies with all the requirements in the Invitation to Bid.

Contractor shall submit to the County, for approval, within ten (10) days from notice of contract award, all Certificates of Insurance evidencing the required coverage as described under Section 37, Requirement of and Proof of Insurance, or if different, then as described within the Special Provisions or resultant contract.

The contractor shall not commence work under these terms and conditions of the contract until all applicable Purchase Orders, Certificates of Insurance, Performance and Payment Bonds, and Irrevocable Letters of Credit (if required) have been approved by the County of Galveston and the Contractor has received notice to proceed in writing and an executed copy of the contract from the County Purchasing Agent.

19. DISPUTE AFTER AWARD/PROTEST

Any actual or prospective Proposer who is allegedly aggrieved in connection with this procurement or award of a contract resulting therefrom may protest. The protest shall be submitted in writing to the Purchasing Agent within seven (7) calendar days after such aggrieved person knows of or should have known of the facts giving rise thereto. If the protest is not resolved by mutual agreement, the Purchasing Agent will promptly issue a decision in writing to the protestant. If the protestant wishes to appeal the decision rendered by the Purchasing Agent, such appeal must be made to the Commissioners' Court through the Purchasing Agent. The decision of the Commissioners' Court will be final. The Commissioners' Court need not consider protests unless this procedure is followed.

20. PUBLIC INFORMATION ACT (f/k/a Open Records Act)

The proposer acknowledges that the County is a government body for purposes of the Public Information Act, codified as Chapter 552 of the Texas Government Code, and as such is required to release information in accordance with the provisions of the Public Information Act.

If proposer considers any of its submitted information to be proprietary in nature, trade secret, or otherwise confidential, then it must clearly and conspicuously mark such information as proprietary, trade, secret, or confidential. By the submission of its Bid, proposer expressly affirms that it has clearly and conspicuously marked any information within its submission that proposer considers confidential, proprietary, and/or trade secret.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

In the event the County receives a request for information under the Public Information Act seeking information that the proposer has marked as confidential, proprietary, and /or trade secret, then the County agrees that it shall provide notice to the proposer of the request for information and the request for decision process under the Public Information Act. Thus, the County will submit the initial correspondence to the Texas Attorney General – however, the burden is and shall be on the proposer to submit correspondence to the Attorney General if the proposer wishes its information to be withheld. Proposer is deemed to have knowledge of the Public Information Act. **By the submission of its Bid, proposer expressly acknowledges that the burden to withhold its' information from public disclosure lays with the proposer;** thus, proposer further acknowledges and agrees that it shall submit comments to the Texas Attorney General in the request for decision process if proposer wishes to have its' information withheld from public disclosure.

21. BIDDER'S E-MAIL ADDRESSES – CONSENT TO DISCLOSURE

Notwithstanding the foregoing Section 20, proposer acknowledges and agrees that the confidentiality of any and all email addresses proposer uses or discloses in communicating with the County are **open** to the public in accordance with Section 552.137 of the Government Code and proposer consents to the release of its email addresses.

22. RESULTANT CONTRACT

Proposer shall correctly and fully execute the resultant contract first. After this, the contract shall be set for consideration by the Commissioners' Court. If the Commissioners' Court authorizes the execution of the contract, the resultant contract shall become effective upon the Commissioners' Court execution of same, provided that the contract is executed by all parties to the contract. Contract documents shall consist of the contract, the General and Special Provisions, drawings, Bid package (including best and final offer(s) if such is utilized), any addenda issued, and any change orders issued during the work. If applicable to the attached Bid, proposer must sign three (3) original contracts and return all three with their Bid submittal.

Proposer should submit a proposed contract with its Bid or its sample material terms and conditions for review and consideration.

23. CONTRACT TERM

The term of the resultant contract will begin on the date of full execution or the execution by the Commissioners' Court, whichever is later, and will terminate on the date specified in the resultant contract unless terminated earlier as herein set forth.

24. TERMINATION FOR DEFAULT

Failure of either party in the performance of any of the provisions of this contract shall constitute a breach of contract, in which case either party may require corrective action within ten (10) business days from date of receipt of written notice citing the exact nature of such breach. Failure of the party being notified to take corrective action within the prescribed ten (10) business days, or failure to provide written reply of why no breach has occurred, shall constitute a Default of Contract.

All notices relating to default by proposer of the provisions of the contract shall be issued by the County through its Legal Department, and all replies shall be made in writing to the County Legal Department. Notices issued by or issued to anyone other than the County Legal Department shall be null and void and shall be considered as not having been issued or received.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

Galveston County reserves the right to enforce the performance of this contract in any manner prescribed by law in the event of breach or default of this contract, and may contract with another party, with or without solicitation of Bids or further negotiations. At a minimum, proposer shall be required to pay any difference in service or materials, should it become necessary to contract with another source, plus reasonable administrative costs and attorney fees.

In the event of Termination for Default, Galveston County, its agents or representatives shall not be liable for loss of any profits anticipated to be made by proposer.

In addition to the remedies stated herein, the County has the right to pursue other remedies permitted by law or in equity.

No waiver by either party of any event of default under this agreement shall operate as a waiver of any subsequent default under the terms of this agreement.

County reserves the right to terminate this contract immediately in the event proposer:

- A. Fails to meet delivery or completion schedules; and/or
- B. Fails to otherwise perform in accordance with the accepted Bid and the contract.

25. TERMINATION FOR CONVENIENCE

County may terminate this contract upon at least thirty (30) calendar days prior written notice for its convenience or for any reason deemed by the County to serve the public interest. As well, County may terminate this contract upon thirty (30) calendar days prior written notice for any reason resulting from any governmental law, order, ordinance, regulation, or court order. In no event shall County be liable for loss of any profits anticipated to be made hereunder by proposer should this contract be terminated early.

26. FORCE MAJEURE

If by reason of Force Majeure either Party shall be rendered unable, wholly or in part, to carry out its responsibilities under this contract by any occurrence by reason of Force Majeure, then the Party unable to carry out its responsibility shall give the other Party notice and full particulars of such Force Majeure in writing within a reasonable time after the occurrence of the event, and such notice shall suspend the Party's responsibility for the continuance of the Force Majeure claimed, but for no longer period.

Force Majeure means acts of God, floods, hurricanes, tropical storms, tornadoes, earthquakes, or other natural disasters, acts of a public enemy, acts of terrorism, sovereign conduct, riots, civil commotion, strikes or lockouts, and other causes that are not occasioned by either Party's conduct which by the exercise of due diligence the Party is unable to overcome and which substantially interferes with operations.

27. ESTIMATED QUANTITIES

Any reference to quantities shown in the Invitation to Bid is an estimate only. Since the exact quantities cannot be predetermined, the County reserves the right to adjust quantities as deemed necessary to meet its requirements.

28. CONTRACTOR INVESTIGATION

Before submitting a Bid, each proposer shall make all investigations and examinations necessary to ascertain all site conditions and requirements affecting the full performance of the contract and to verify any representations made by

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

the County upon which the contractor will rely. Proposer shall exercise due diligence and is further charged with knowledge of the local, State, and Federal laws, rules, and regulations applicable to this contract. If the proposer receives an award as a result of its Bid submission in this procurement, the Bidder's failure to have made such investigations and examinations will in no way relieve the proposer from its obligation to comply in every detail with all provisions and requirements of the contract, nor will a plea of ignorance of such conditions and requirements be accepted as a basis for any claim whatsoever by the contractor for additional compensation and/or for excused nonperformance.

29. NO COMMITMENT BY COUNTY OF GALVESTON

This request for procurement does not commit the County of Galveston to award any costs or pay any costs, or to award any contract, or to pay any costs associated with or incurred in the preparation of a Bid in response to this Invitation to Bid and does not commit the County of Galveston to procure or contract for services or supplies.

30. BID COSTS BORNE BY PROPOSER

Galveston County shall not be liable for any costs incurred by proposer in preparation, production, or submission of a Bid, including but not limited to best and final offer if applicable. As well, Galveston County shall not be liable for any work performed by proposer prior to issuance of fully executed contract and properly issued notice to proceed. Galveston County shall not be liable for any costs incurred by proposer by reason of attending a pre-Bid conference. Galveston County shall not be liable for any costs incurred by proposer by reason of the County invoking use of best and final offers.

31. BEST AND FINAL OFFERS (BAFO)

In acceptance of Bids, the County reserves the right to negotiate further with one or more of the proposers as to any features of their Bids and to accept modifications of the work and price when such action will be in the best interest of the County. This includes, but is not limited to, the solicitation of a Best and Final Offer from one or more of the proposers. If a Best and Final Offer is invoked, this allows acceptable proposers the opportunity to amend, change, or supplement their original Bid. Proposers may be contacted in writing by the Purchasing Agent, requesting that they submit their Best and Final Offer. Any such Best and Final Offer must include discussed and negotiated changes.

32. SINGLE BID RESPONSE

If only one Bid is received in response to the Invitation to Bid, a detailed cost Bid may be requested of the single proposer. A cost/price analysis and evaluation and/or audit may be performed of the cost Bid in order to determine if the price is fair and reasonable.

33. CHANGES IN SPECIFICATIONS

If it becomes necessary to revise any part of this Bid, a written notice of such revision will be provided to all proposers in the form of addenda. The County is not bound by any oral representations, clarifications, or changes made in the written specifications by the County's employees or officials, unless such clarification or change is provided to proposers in a written addendum from the Purchasing Agent. Proposers are advised to inquire prior to the submission deadline as to whether any addenda to this Invitation to Bid have been issued, as the successful proposer will be required to abide by such addenda.

The County of Galveston reserves the right to revise or amend the specifications up to the time set for opening of Bids. Such revisions and amendments, if any, shall be announced by form of addenda. Copies of such addenda (or addendum in the event only one addendum is issued in the procurement) shall be furnished to all prospective

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

contractors. Prospective contractors are defined as those contractors listed on the County's Invitation to Bid list for this material/service or those who have obtained documents from the Purchasing Agent's Office subsequent to the advertisement. If revisions and amendments require changes in quantities or prices proposed, or both, the date set for opening of Bids may be postponed by such number of days as in the opinion of the County shall enable prospective contractors to revise their Bids. In any case, the Bid opening shall be at least seven (7) business days after the last revising or amendment addendum and the addendum shall include an announcement of the new date, if applicable, for the opening of Bids.

34. BID IDEAS AND CONCEPTS

The County reserves to itself the right to adopt or use for its benefit, any concept, plan, or idea contained in any Bid.

35. BID DISCLOSURES

While this procurement is pending, the names of those who submitted Bids will not be made public unless in conformity with the County Purchasing Act. Likewise, no pricing, staffing, or other contents of the Bid information will be released unless in conformity with the County Purchasing Act. Proposers are requested to withhold all inquiries regarding their Bid or other submissions until after an award is made. No communication is to be had with any County employee or official, other than the County Purchasing Agent, regarding whether a Bid was received - violations of this provision may result in the rejection of a Bid.

36. INDEMNIFICATION

The contractor agrees to assume all risks and responsibility for, and agrees to indemnify, defend, and save harmless, the County of Galveston, its elected and appointed officials and department heads, and its agents and employees from and against all claims, demands, suits, actions, recoveries, judgments, and costs and expenses including reasonable attorney's fees for the defense thereof, arising out of or in connection therewith on account of the loss of life, property or injury or damage to the person which shall arise from contractor's operations under this contract, its use of County facilities and/or equipment or from any other breach on the part of the contractor, its employees, agents or any person(s), in or about the County's facilities with the expressed or implied consent of the County. Contractor shall pay any judgment with cost which may be obtained against Galveston County resulting from contractor's operations under this contract.

Contractor agrees to indemnify and hold the County harmless from all claims of subcontractors, laborers incurred in the performance of this contract. Contractor shall furnish satisfactory evidence that all obligations of this nature herein above designated have been paid, discharged or waived. If Contractor fails to do so, then the County reserves the right to pay unpaid bills of which County has written notice direct and withhold from Contractor's unpaid compensation a sum of money reasonably sufficient to liquidate any and all such lawful claims.

37. REQUIREMENT OF AND PROOF OF INSURANCE

The successful proposer shall furnish evidence of insurance to the County Purchasing Agent and shall maintain such insurance as required hereunder or as may be required in the Special Provisions or resultant contract, if different. Contractor shall obtain and thereafter continuously maintain in full force and effect, commercial general liability insurance, including but not limited to bodily injury, property damage, and contractual liability, with combined single limits as listed below or as may be required by State or Federal law, whichever is greater.

- A. For damages arising out of bodily injury to or death of one person in any one accident :
ONE HUNDRED THOUSAND AND NO/100 (\$100,000.00) DOLLARS.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

- B. For damages arising out of bodily injury to or death of two or more persons in any one accident:
THREE HUNDRED THOUSAND AND NO/100 (\$300,000.00) DOLLARS.
- C. For any injury to or destruction of property in any one accident :
ONE HUNDRED THOUSAND AND NO/100 (\$100,000.00) DOLLARS.

Insurance shall be placed with insurers having an A.M. Best’s rating of no less than A. Such insurance must be issued by a casualty company authorized to do business in the State of Texas, and in standard form approved by the Board of Insurance Commissioners’ of the State of Texas, with coverage provisions insuring the public from loss or damage that may arise to any person or property by reason of services rendered by Contractor.

Galveston County shall be listed as the additional insured on policy certificates and shall be provided with no less than thirty (30) calendar days prior notice of any changes to the policy during the contractual period.

Certificates of Insurance, fully executed by a licensed representative of the insurance company written or countersigned by an authorized Texas state agency, shall be filed with the County Purchasing Agent within ten (10) business days of issuance of notification from the County Purchasing Agent to proposer that the contract is being activated as written proof of such insurance and further provided that proposer shall not commence work under this contract until it has obtained all insurance required herein, provided written proof as required herein, and received written notice to proceed issued from the County Purchasing Agent.

Proof of renewal/replacement coverage shall be provided prior to the expiration, termination, or cancellation date of any policy and Galveston County shall be named as an additional insured on any such renewal/replacement coverage and a certificate of insurance showing such shall be provided to the Purchasing Agent. Said insurance shall not be cancelled, permitted to expire, or changed without at least thirty (30) days prior written notice to the County.

Insurance required herein shall be maintained in full force and effect during the life of this contract and shall be issued on an occurrence basis. Contractor shall require that any and all subcontractors that are not protected under the Contractor’s own insurance policies take and maintain insurance of the same nature and in the same amounts as required of Contractor and provide written proof of such insurance to Contractor. Proof of renewed/replacement coverage shall be provided prior to the expiration, termination, or cancellation date of any policy. Contractor shall not allow any subcontractor to commence work on the subcontract until such insurance required for the subcontractor has been obtained and approved.

Workers’ Compensation Insurance: Successful proposer shall carry in full force Workers’ Compensation Insurance Policy(ies), if there is more than one employee, for all its’ employees, including but not limited to full time, part time, and emergency employees employed by the successful proposer. Current insurance certificates certifying that such policies as specified above are in full force and effect shall be furnished by successful proposer to the County.

Insurance is to be placed with insurers having a Best rating of no less than A. The proposer shall furnish the County with certificates of insurance and original endorsements affecting coverage required by these insurance clauses within ten (10) business days of receiving notification from the County Purchasing Agent that the contract is being activated. The certificates and endorsements for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf. The proposer shall be required to submit annual renewals for the term of this contract prior to expiration of any policy.

In addition to the remedies stated herein, the County has the right to pursue other remedies permitted by law or in equity.

The County agrees to provide proposer with reasonable and timely notice of any claim, demand, or cause of action made or brought against the County arising out of or related to utilization of the property. Proposer shall have the

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

right to defend any such claim, demand, or cause of action at its sole cost and expense and within its sole and exclusive discretion. The County agrees not to compromise or settle any claim or cause of action arising out of or related to the utilization of the property without the prior written consent of the proposer.

In no event shall the County be liable for any damage to or destruction of any property belonging to the proposer.

Subrogation Waiver. Proposer and Bidder's insurance carrier waive any and all rights to subrogation against Galveston County in regard to any suit or claim arising out of personal injury or property damage resulting from Bidder's performance under this agreement.

38. BID GUARANTEE

Unless specified differently within the Special Provisions of this procurement, each proposer shall be required to submit a Bid guarantee with its Bid as required within this Section.

Evidencing its firm commitment to engage in contract if proposer is selected for award of contract, each proposer is required to furnish with their bid a cashier's check or an acceptable Bidder's bond (generally, a bid bond) in the amount of five percent (5%) of the total contract price. If proposer is using a bond, then the bond must be executed with a surety company authorized to do business in the State of Texas. Failure to furnish the Bid guarantee in the proper form and amount, by the time set for opening of Bids may be cause for rejection of the Bid.

The cashier's check or proposer bond (as applicable) will be returned to each respective unsuccessful proposer(s) subsequent to the Commissioners' Court award of contract and shall be returned to the successful proposer upon the completion and submission of all contract documents. Provided however, that the cashier's check or proposer bond will be forfeited to the County as liquidated damages should successful proposer fail to execute the contract within thirty (30) days after receiving notice of the acceptance of its Bid.

39. PERFORMANCE AND PAYMENT BONDS (if required)

Successful proposer, before beginning work, shall execute a performance bond and a payment bond, each of which must be in the amount of the contract. The required payment and performance bonds must each be executed by a corporate surety authorized to write surety bonds in the State of Texas and in accordance with Chapter 3503 of the Insurance Code (codified in 2005 and originally within Section 1, Chapter 87, Acts of the 56th Leg., R.S., 1959, and in Article 7.19-1, Vernon's Texas Insurance Code).

The performance and payment bonds must each clearly and prominently display on the bond or on an attachment to the bond:

- a.) The name, mailing address, physical address, and telephone number, including the area code, of the surety company to which any notice of claim should be sent; or
- b.) The toll-free telephone number maintained by the Texas Department of Insurance under Subchapter B, Chapter 521, Insurance Code, and a statement that the address of the surety company to which any notice of claim should be sent may be obtained from the Texas Department of Insurance by calling the toll free-telephone number.

The performance bond shall be solely for the protection of Galveston County, in the full amount of the contract, and conditioned on the faithful performance of the work in accordance with the plans, specifications, and contract documents. The payment bond is solely for the protection and use of payment bond beneficiaries who have a direct contractual relationship with the prime contractor or a subcontractor to supply labor or material, and in the amount of the contract.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

The payment and performance bonds required to be furnished herein must be furnished before the contractor begins work and are a requirement for issuance of a Notice to Proceed. Such bonds must be furnished to the Galveston County Purchasing Agent within thirty (30) calendar days after the date of the full execution of the contract or, if applicable, as required under Chapter 2253, Government Code, whichever is earlier. Contractor's failure to provide the required payment and performance bonds within such time period shall constitute an event of default under this contract. Contractor shall not commence work until all applicable certificates of insurance, performance bonds, and payment bonds have been received and approved by the County Purchasing Agent and the Contractor receives notice to proceed in writing that has been issued by the County Purchasing Agent.

Additionally, if this Invitation to Bid is for the award of a public works contract, then compliance with Chapter 2253 of the Texas Government Code, which is known as the McGregor Act, is mandatory. Performance and payment bonds are required to be furnished in accordance with Chapter 2253 of the Texas Government Code. Proposer should familiarize itself with the entire provisions of Chapter 2253 of the Texas Government Code.

40. PATENT AND COPYRIGHT PROTECTION

The proposer agrees at its sole expense to protect the County from claims involving infringement of patents, copyright, trademark, trade secret, or other intellectual property rights. **Proposer shall indemnify and save harmless the County of Galveston, its officers, employees, and agents, from liability of any nature and kind whatsoever, including without limitation cost and expenses, for or on account of any copyrighted, trademarked, trade secret, patented or un-patented invention, process, or article manufactured or used in the performance of the contract, or other intellectual property rights, including its use by the County.** Proposer also agrees that if proposer is awarded this contract, that no work performed hereunder shall be subject to patent, copyright, or other intellectual property by proposer.

41. CONFLICT OF INTEREST DISCLOSURE REPORTING (FORM CIQ)

Proposer may be required under Chapter 176 of the Texas Local Government Code to complete and file a conflict of interest questionnaire (CIQ Form). The CIQ Form pertains to business relationship, gift giving and family relationship reporting. If proposer is required to file a CIQ Form, then the completed CIQ Form must be filed with the County Clerk of Galveston County, Texas.

Business relationship. If proposer has an employment or other business relationship with a local government officer of Galveston County or with a family member of a local government officer of Galveston County that results in the officer or family member of the officer receiving taxable income that exceeds \$2,500.00 during the preceding 12-month period, then proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

Gift-giving. If proposer has given a local government officer of Galveston County or a family member of a local government officer of Galveston County one or more gifts with an aggregate value of more than one-hundred dollars (\$100.00) during the preceding 12-months, then proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

Family member. For purposes of the business relationship and gift giving reporting requirements, a "family member" means a person related to another person with the first degree of consanguinity or affinity, as described by Subchapter B, Chapter 573, Texas Government Code. Examples of persons within the first degree by consanguinity or affinity include a son, daughter, father, mother, spouse, son-in-law, daughter-in-law, father-in-law, mother-in-law, stepson, stepdaughter, stepmother, and stepfather.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

Family relationship. If proposer has a “family relationship” with a local government officer of Galveston County then proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County, regardless of whether proposer has a business relationship or has given gifts to the local government officer or a family member of the local government officer. For this purpose, “family relationship” means proposer is related within the third degree by consanguinity or the second degree by affinity, as those terms are defined under Chapter 573 of the Texas Government Code, to a local government officer of Galveston County. Examples of such relationships include a son, daughter, mother, father, brother, sister, grandchild, great-grandchild, grandparent, great-grandparent, niece, nephew, uncle, aunt, spouse, mother-in-law, father-in-law, daughter-in-law, son-in-law, spouse’s grandchild, spouse’s grandparent, grandparent’s spouse, grandchild’s spouse, stepson, stepdaughter, stepmother, and stepfather.

Proposer must file its original CIQ Form with the Galveston County Clerk. The Galveston County Clerk has offices at the following locations:

Galveston County Clerk
Galveston County Justice Center, Suite 2001
600 59th Street
Galveston, Texas 77551

Galveston County Clerk
North County Annex, 1st Floor
174 Calder Road
League City, Texas 77573

Again, if proposer is required to file a CIQ Form, the original completed form is filed with the Galveston County Clerk (**not the Purchasing Agent**).

For Bidder’s convenience, a blank CIQ Form is enclosed with this Bid package. Blank CIQ Form(s) may also be obtained by visiting the Purchasing Agent’s website – this website is linked from the Galveston County homepage, at <http://www.galvestoncountytexas.gov>.

Chapter 176 specifies deadlines for the filing of CIQ Forms (both initial filings and updated filings).

It is Bidder’s sole responsibility to file a true and complete CIQ Form with the Galveston County Clerk if proposer is required to file by the requirements of Chapter 176 of the Local Government Code. Proposer is advised that it is an offense to fail to comply with the disclosure reporting requirements dictated under Chapter 176 of the Texas Local Government Code, and the failure to file may be grounds to void the contract, if proposer is awarded a contract.

If proposer has any questions about compliance with Chapter 176, proposer may wish to consult its’ legal counsel. Compliance is the individual responsibility of each person, business, and agent who is subject to Chapter 176 of the Texas Local Government Code.

42. DISCLOSURE OF INTERESTED PARTIES/FORM 1295

Under Section 2252.908 of the Government Code, any business entity that enters into a contract with Galveston County that requires the approval of the Commissioners’ Court must submit a “Disclosure of Interested Parties” to the County prior to the execution of the contract. This form, the “Disclosure of Interested Parties” form was promulgated by the Texas Ethics Commission, and is the “Form 1295”. **This procurement is subject to these requirements.**

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

The Texas Ethics Commission was charged with promulgating rules to implement Section 2252.908 of the Government Code. The rules adopted by the Texas Ethics Commission are located at Sections 46.1, 46.3, and 46.5 of Title 1 of the Texas Administrative Code. Thus, the law covering these requirements is located at Section 2252.908 of the Government Code, and in Title 1, Sections 46.1, 46.3, and 46.5 of the Texas Administrative Code.

The Texas Ethics Commission's website is: www.ethics.state.tx.us. The area of the Texas Ethics Commission website pertaining to Form 1295 is:

www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm.

Form 1295 must be completed electronically through the Texas Ethics Commission website (handwritten forms are not allowable). Once the business entity has completed their electronic filing of Form 1295, then the business entity must print out the electronically completed form, and sign and notarize the Form 1295. Once Form 1295 is signed and notarized, the business entity must submit their completed, signed, and notarized Form 1295 to the Galveston County Purchasing Agent.

Successful Proposer is and shall be subject to these requirements, and no resultant contract may be executed by the Commissioners' Court until the completed, signed, and notarized Form 1295 is on file with the County Purchasing Agent.

No portion of the Form 1295 process commits the County to any type of award of contract whatsoever.

After the Purchasing Agent's Office receives the completed, signed, and notarized Form 1295, the Purchasing Agent's Office will, within 30 days, go the Texas Ethics Commission website to submit electronic confirmation of the County's receipt of the completed, signed, and notarized Form 1295.

43. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS & REQUIREMENT TO REGISTER IN SAM

Proposer certifies that neither it, nor any of its Principals, are presently debarred, suspended, proposed for debarment, disqualified, excluded, or in any way declared ineligible for the award of contracts by any Federal agency. Contractor agrees that it shall refund Galveston County for any payments made to Contractor while ineligible. Contractor acknowledges that Contractor's uncured failure to perform under this Agreement, if such should occur, may result in Contractor being debarred from performing additional work for the County, the respecting State Agency administering the grant funding the contract, if applicable, the State, FEMA or HUD (as applicable), and other Federal and State entities. Further, proposer has executed the Certification Regarding Debarment, Suspension, Proposed Debarment, and Other Responsibility Matters and returned the fully completed and executed original certification with the submission of its Bid. **The truthful and fully completed and executed original of the Certification Regarding Debarment, Suspension, Proposed Debarment, and Other Responsibility Matters must be included with the submission of Bidder's Bid and is a mandatory requirement of this Invitation to Bid. Bidder's failure to include the fully completed and executed original of this Certification shall be considered non-compliance with the requirements of this Invitation to Bid and grounds for the rejection of Bidder's Bid.** Proposer shall immediately notify the County Purchasing Agent if it becomes debarred or suspended, placed on the Consolidated List of Debarred Contractors, or in any other way becomes ineligible for award of contract by any Federal agency. This Certification is a material fact relied upon by Galveston County; if it is later determined that the contractor did not comply with 2 C.F.R. Part 180 and 2 C.F.R. Part 3000, in addition to the remedies available to Galveston County and the State agency administering this grant, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment of contractor.

If the contract to be awarded pursuant to this procurement involves the use of Federal funds, then proposer must also be registered in the Federal Contractor Registry through the System for Award Management (SAM) to be eligible for

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

award of contract pursuant to this procurement.

Information regarding the SAM is available at:

<http://www.federalcontractorregistry.com/?gclid=CIG1hf2rr8wCFYkCaQoducANZw> or at
<https://www.sam.gov/portal/SAM/#1>.

No contract involving the use of Federal funds may be awarded to any proposer unless and until such registration is current and in good standing under SAM. Successful proposer must maintain SAM registration throughout the entire term of the agreement with the County. If this contract involves the use of Federal funds, then proposer must enclose proof of such SAM registration within its response, which is also a mandatory requirement of this procurement; failure to enclose such proof shall be considered non-compliance with the requirements of this procurement and grounds for the rejection of Bidder's response to this procurement (i.e., bid, Bid, or qualifications statement, as applicable).

44. TRANSACTIONS WITH TERRORIST ORGANIZATIONS PROHIBITED (Texas Government Code 2252.151, 2252.152)

Prohibition on contracts with certain companies per Government Code 2252.151 Definitions:

(1) **"Company"** has the meaning assigned by Section 806.001.

(2) **"Foreign terrorist organization"** means an organization designated as a foreign terrorist organization by the United States secretary of state as authorized by 8 U.S.C. Section 1189.

(3) **"Governmental contract"** means a contract awarded by a governmental entity for general construction, an improvement, a service, or a public works project for a purchase of supplies, materials, or equipment. The term includes a contract to obtain a professional or consulting service subject to Government Code, Chapter 2254.

(4) **"Governmental entity"** has the meaning assigned by Government Code, Section 2252.001.

Pursuant to Chapter 2252, Texas Government Code, Contractor shall certify that, at the time of execution of this Contract, neither the Contractor, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same (1) engages in business with Iran, Sudan, or any foreign terrorist organization as described in Chapters 806 or 807 of the Texas Government Code, or Subchapter F of Chapter 2252 of the Texas Government Code, or (2) is a company listed by the Texas Comptroller of Public Accounts under Sections 806.051, 807.051, or 2252.153 of the Texas Government Code.

45. VERIFICATION NOT TO BOYCOTT ISRAEL

Prohibition on contracts with companies boycotting Israel per Government Code 2271.001 Definitions:

(1) **"Boycott Israel"** has the meaning assigned by Section 808.001.

(2) **"Company"** has the meaning assigned by Section 808.001; except that the term does not include a sole proprietorship.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

(2) "**Governmental entity**" has the meaning assigned by Government Code, Section 2251.001.

PROVISION REQUIRED IN CONTRACT. (a) This section applies only to a contract that:

- (1) is between a governmental entity and a company with 10 or more full-time employees; and
- (2) has a value of \$100,000 or more that is to be paid wholly or partly from public funds of the governmental entity.

(b) A governmental entity may not enter into a contract with a company for goods or services unless the contract contains a written verification from the company that it:

- (1) does not boycott Israel; and
- (2) will not boycott Israel during the term of the contract.

As required by GOVERNMENT CODE, CHAPTER 2271, **CONTRACTOR hereby verifies that it does not boycott Israel and will not boycott Israel throughout the term of this Agreement.** For the purposes of this verification, "Boycott Israel" means refusing to deal with, terminating business activities, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

46. SOVEREIGN IMMUNITY

The County specifically reserves any claim it may have to sovereign, qualified, or official immunity as a defense to any action arising in conjunction with this contract.

47. CONTROLLING LAW AND VENUE

Proposer acknowledges and agrees that the contract is and shall be governed and construed by the laws of the State of Texas and that venue shall lie exclusively in a court of competent jurisdiction in Galveston County, Texas.

48. MERGERS, ACQUISITIONS

The Proposer shall be required to notify the County of any potential for merger or acquisition of which there is knowledge at the time that a Bid is submitted.

If subsequent to the award of any contract resulting from this Invitation to Bid the proposer shall merge or be acquired by another firm, the following documents must be submitted to the County:

- A. Corporate resolutions prepared by the awarded Bidder and the new entity ratifying acceptance of the original contract, terms, conditions and prices;
- B. New entity's Federal Identification Number (FEIN);
- C. New entity's proposed operating plans;
- D. New entity's proof of registration in SAM for contracts involving Federal funds;
- E. New entity's certification regarding debarment;
- F. New entity's certification regarding lobbying; and
- G. W-9 Form for new entity

Moreover, proposer is required to provide the County with notice of any anticipated merger or acquisition as soon as proposer has actual knowledge of the anticipated merger or acquisition. The New Bidder's proposed plan of operation

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

must be submitted prior to merger to allow time for submission of such plan to the Commissioners’ Court for its approval.

49. DELAYS

The County reserves the right to delay the scheduled commencement date of the contract if it is to the advantage of the County. There shall be no additional costs attributed to these delays should any occur. Proposer agrees it will make no claims for damages, for damages for lost revenues, for damages caused by breach of contract with third parties, or any other claim by proposer attributed to these delays, should any occur. In addition, proposer agrees that any contract it enters into with any third party in anticipation of the commencement of the contract will contain a statement that the third party will similarly make no claim for damages based on delay of the scheduled commencement date of the contract.

50. ACCURACY OF DATA

Information and data provided through this Invitation to Bid are believed to be reasonably accurate.

51. SUBCONTRACTING/ASSIGNMENT

Proposer shall not assign, sell, or otherwise transfer its contract in whole or in part without prior written permission of the County acting by and through its Commissioners’ Court. Such consent, if granted, shall not relieve the proposer of any of its responsibilities under this contract.

52. INDEPENDENT CONTRACTOR

Proposer expressly acknowledges that it is an independent contractor. Nothing in this agreement is intended nor shall be construed to create an agency relationship, an employer/employee relationship, a joint venture relationship, or any other relationship allowing County to exercise control or direction over the manner or method by which proposer or Bidder’s subcontractors perform in providing the requirements stated in the Invitation to Bid.

53. MONITORING PERFORMANCE

The County shall have the unfettered right to monitor and audit the Bidder’s work in every respect. In this regard, the proposer shall provide its full cooperation and insure the cooperation of its employees, agents, assigns, and subcontractors. Further, the proposer shall make available for inspection and/or copying when requested, original data, records, and accounts relating to the Bidder’s work and performance under this contract. In the event any such material is not held by the proposer in its original form, a true copy shall be provided.

54. SUBJECT TO APPROPRIATION OF FUNDS

State law prohibits the obligation and expenditure of public funds beyond the fiscal year for which a budget has been approved by the Commissioners’ Court. Galveston County anticipates this to be an integral part of future budgets to be approved during the periods of this contract, except for unanticipated needs or events which may prevent such payments against this contract. However, Galveston County cannot guarantee the availability of funds, and enters into this contract only to the extent such funds are made available through appropriation (allocation) by the Commissioners’ Court. This contract shall not be construed as creating any debt on behalf of the County of Galveston in violation of TEX. CONST. art. XI, § 7, and it is understood that all obligations of Galveston County are subject to the availability of funds.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

55. CONTRACTS SUBJECT TO GRANT FUNDING

Notwithstanding the foregoing, if the contract to be awarded by this procurement is funded with Federal or State grant funds, the proposer acknowledges that the obligations of the County under the contract are contingent upon the continued availability of grant funding to meet the County's obligations. If the grant(s) to the County is reduced, de-obligated, or otherwise discontinued or terminated, Contractor agrees that the County may immediately terminate the contract without penalty or any liability whatsoever on the part of the County, the State, or the Federal awarding agency.

56. PROCUREMENT ETHICS

Galveston County is committed to the highest ethical standards. Therefore, it is a serious breach of the public trust to subvert the public purchasing process by directing purchases to certain favored vendors, or to tamper with the competitive bidding process, whether it's done for kickbacks, friendship or any other reason. Since misuse of the purchasing power of a local government carries criminal penalties, and many such misuses are from a lack of clear guidelines about what constitutes an abuse of office, the Code of Ethics outlined below must be strictly followed.

Galveston County also requires ethical conduct from those who do business with the County.

CODE OF ETHICS – Statement of Purchasing Policy:

Public employment is a public trust. It is the policy of Galveston County to promote and balance the objective of protecting the County's integrity and the objective of facilitating the recruitment and retention of personnel needed by Galveston County. Such policy is implemented by prescribing essential standards of ethical conduct without creating unnecessary obstacles to entering public office.

Public employees must discharge their duties impartially so as to assure fair competitive access to governmental procurement by responsible contractors. Moreover, they should conduct themselves in such a manner as to foster public confidence in the integrity of the Galveston County procurement organization.

To achieve the purpose of this Article, it is essential that those doing business with Galveston County also observe the ethical standards prescribed herein.

General Ethical Standards:

It shall be a breach of ethics to attempt to realize personal gain through public employment with Galveston County by any conduct inconsistent with the proper discharge of the employee's duties.

It shall be a breach of ethics to attempt to influence any public employee of Galveston County to breach the standards of ethical conduct set forth in this code.

It shall be a breach of ethics for any employee of Galveston County to participate directly or indirectly in a procurement when the employee knows that:

- The employee or any member of the employee's family, has a financial interest pertaining to the procurement;
- A business or organization in which the employee or any member of the employee's family, has a financial interest pertaining to the procurement; or
- Any other person, business, or organization with which the employee or any member of the employee's family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

Gratuities:

It shall be a breach of ethics for any person to offer, give, or agree to give any employee or former employee of Galveston County, or for any employee or former employee of Galveston County to solicit, demand, accept or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract, or to any solicitation or bid pending before this government.

Kickbacks:

It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor for any contract for Galveston County, or to any person associated therewith, as an inducement for the award of a contract, subcontract or order.

Contract Clause:

The prohibition against gratuities and kickbacks prescribed above shall be conspicuously set forth in every contract and solicitation by Galveston County.

Confidential Information:

It shall be a breach of ethics for any employee or former employee of Galveston County to knowingly use confidential information for actual or anticipated personal gain, or for the actual or anticipated gain of any other person.

Prohibition against Contingent Fees:

It shall be a breach of ethical standards for a person to be retained, or to retain a person, to solicit or secure a Galveston County contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except for retention of bona fide employees or bona fide established commercial selling agencies for the purpose of securing business. Failure to abide by this section constitutes a breach of ethical standards.

Representation:

Proposer represents and warrants, by signing and submitting its Bid, that it has not retained anyone in violation of this section prohibiting contingent fees.

Contract Clause:

The representation prescribed above shall be conspicuously set forth in every contract and solicitation thereof.

57. NON-COLLUSION AFFIDAVIT

Proposer certifies, by signing and submitting a Bid, that the Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or sham; that the contractor has not directly or indirectly induced or solicited another contractor to put in a false or sham Bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any contractor or anyone else to put in a sham Bid or that anyone shall refrain from bidding; that the contractor has not in any manner, directly or indirectly, sought by agreement, communications, or conference with anyone to fix the bid price of the

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

contractor of any other proposer, or to fix any overhead, profit or cost element of the Bid price, or that of any other contractor, or to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in the Bid are true; and further, that the contractor has not, directly or indirectly, submitted his or her Bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any cooperation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham Bid.

A blank Non-Collusion Affidavit is included with this Bid packet. Proposer must enclose a truthful and fully executed original Non-Collusion Affidavit with the submission of its Bid. This is a mandatory requirement of this Invitation to Bid. Failure to include the truthfully and fully executed Non-Collusion Affidavit in the submission of its Bid shall be considered non-compliance with the requirements of this Invitation to Bid by the Proposer and grounds for the rejection of Bidder's submission.

No negotiations, decisions, or actions shall be initiated by any company as a result of any verbal discussion with any County employee prior to the opening of responses to this Invitation to Bid.

No officer or employee of the County of Galveston, and no other public or elected official, or employee, who may exercise any function or responsibilities in the review or approval of this undertaking shall have any personal or financial interest, direct or indirect, in any contract or negotiation process thereof. The above compliance request will be part of all County of Galveston contracts for this service.

58. CERTIFICATION REGARDING LOBBYING

Proposer certifies that:

- a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the bidder, to any person for influencing or attempting to influence a department or employee of an agency, a member of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.
- b. If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence a department or employee of any agency, a member of Congress, a department or employee of congress, or an employee of a member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, the bidder shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions.
- c. Proposer shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

The truthful and fully completed and executed original of the Certification Regarding Lobbying (included with bid packet) must be included with the submission of Bidder's Bid and is a mandatory requirement of this Invitation to Bid. Bidder's failure to include the fully completed and executed or original of this Certification shall be considered non-compliant with the requirements of this Invitation to Bid and grounds for the rejection of the Bidder's Bid. Submission of the certification is a prerequisite for making or entering into a contract with Proposer and is imposed by Section 1352, Title 31, United States Code. Further, any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

59. NON-DISCRIMINATION

- a. **Equal Employment Opportunity:** Proposer will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, sex, disability, genetic information or veteran status. Proposer will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, national origin, sex, disability, genetic information or veteran status. Such action shall include, but not be limited to, the following: employment; upgrading; demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Proposer agrees to post in conspicuous places, available to employees and applicants for employment, notices of employment.

Proposer will, in all solicitation or advertisements for employees placed by or on behalf of proposer, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, sex, disability, genetic information, or veteran status.

Proposer will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Agreement so that such provisions will be binding upon each subcontractor, provided that the foregoing provisions shall not apply to contracts or subcontracts for standard commercial supplies or raw materials.

Proposer will include the provisions herein in every subcontract or purchase order unless exempted.

- b. **Drug Free Work Place Act:** Proposer shall comply with all applicable requirements of the Drug-Free Workplace Act of 1988 (Public Law 100-690, Title V, Subtitle D; 41 U.S.C. § 8102, et seq.) and implementing regulations thereunder.
- c. **Americans with Disabilities Act:** Proposer shall comply with all applicable provisions of the Americans with Disabilities Act of 1990 (Public Law 101-136) and implementing regulations thereunder.
- d. **OSHA Regulations:** Proposer agrees to maintain and to display any applicable materials for its employees in accordance with OSHA regulations.
- e. **Compliance with Immigration Laws and Use of E-Verify:** Proposer agrees to comply with all requirements of the U.S. Immigration Reform and Control Act of 1986, as amended, and any implementing regulations thereto. Proposer further agrees to utilize the E-Verify system through the Department of Homeland Security on its employees. Proposer shall not employ unauthorized aliens and shall not assign services to be performed to any supplier or subcontractor who are unauthorized aliens. If any personnel performing any services hereunder are discovered to be an unauthorized alien, then Proposer will immediately remove such personnel from performing services hereunder and shall replace such personnel with personnel who are not unauthorized alien(s).
- f. **State and Federal Law Compliance:** Proposer agrees to comply with all other State and Federal laws and regulations applicable to the provision of services under this contract.

60. RECORD RETENTION AND RIGHT TO AUDIT

Proposer shall keep and maintain all records associated with this contract for a minimum of five (5) years from the close of the contract or as required by Federal or State law or regulation, whichever period is longer. If awarded this contract, proposer shall allow the County reasonable access to the records in Bidder's possession, custody, or control that the County deems necessary to assist it in auditing the services, costs, and payments provided hereunder. If this contract involves the use of Federal or State funds, then proposer shall also allow reasonable access to representatives of the Office of Inspector General, the General Accounting Office, the State Auditor's Office, and the other Federal and/or State agencies overseeing the funds that such entities deem necessary to facilitate review by such agencies and

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

proposer shall maintain fiscal records and supporting documentation for all expenditures in a manner that conforms with OMB Circular A-87 (relocated to 2 C.F.R. Part 225) and this contract.

61. TITLE VI ASSURANCES/TxDOT

The County is subject to Title VI of the Civil Rights Act of 1964 and the Federal and State laws and regulations of the United States Department of Transportation and Texas Department of Transportation (TxDOT). Pursuant to these requirements, the County must have its contractors provide required assurances on compliance with non-discrimination by itself and its subcontractors. The Title VI Assurances within this Subsection are not exhaustive – whenever any Federal, State, or Local requirement requires additional clauses, this list shall not be construed as limiting. Contractor agrees as follows:

- (1) **Compliance with Regulations:** The Contractor shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation (hereinafter, DOT) Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are incorporated herein by reference and made a part of this contract.
- (2) **Non-discrimination:** The Contractor, with regard to the work performed by it during the contract, shall not discriminate on the basis of race, color, national origin, religion, sex, age, disability or Veteran status in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.
- (3) **Solicitations for Subcontractors, Including Procurement of Materials and Equipment:** In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, national origin, religion, sex, age, disability or Veteran status.
- (4) **Information and Reports:** The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the Galveston County or the Texas Department of Transportation to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of the Contractor is in the exclusive possession of another who fails or refuses to furnish this information the Contractor shall so certify to Galveston County or the Texas Department of Transportation as appropriate, and shall set forth what efforts it has made to obtain the information.
- (5) **Sanctions for Non-compliance:** In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, Galveston County shall impose such contract sanctions as it or the Texas Department of Transportation may determine to be appropriate, including, but not limited to:
 - (a) withholding of payments to the Contractor under the contract until the Contractor complies, and/or;
 - (b) cancellation, termination, or suspension of the contract, in whole or in part.
- (6) **Incorporation of Provisions.** The Contractor shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as Galveston County or the Texas Department of Transportation may direct as a means of enforcing such provisions including sanctions for non-compliance: Provided, however, that, in the event Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction,

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

the Contractor may request Galveston County to enter into such litigation to protect the interests of Galveston County, and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

62. SECTION 231.006, FAMILY CODE/DELINQUENT CHILD SUPPORT

Pursuant to Title 5, Section 231.006 of the Texas Family Code, as applicable, Proposer certifies that it, including all of its principals, is/are current in child support payments and that it is eligible to receive payments from State funds under a contract for property, materials, or services. Proposer acknowledges and agrees that if it is awarded this contract, then the ensuing agreement may be terminated and payment withheld if this certification is inaccurate. Finally, by the submission of its Bid, the Proposer certifies that it has included the names and social security numbers of each person with at least 25% ownership interest in Proposer within its response to the Invitation to Bid and that all such persons are current in child support payments.

63. ANTITRUST

Pursuant to 15 U.S.C. § 1, et seq., and Texas Business and Commerce Code, Chapter 15, Contractor, by the submission of its Bid, certifies that neither Contractor nor any natural person, proprietorship, firm, corporation, partnership, association, or institution represented by Contractor or anyone acting for such natural person, proprietorship, firm, corporation, partnership, association, or institution has violated any Federal or State antitrust laws or communicated the nature of the offer, directly or indirectly, to any competitor or other person engaged in a similar line of business.

64. LABOR STANDARDS

On contracts funded under a federal grant: Proposer acknowledges that the contract to be awarded pursuant to this solicitation is on a grant program funded with Federal funds. Proposer shall comply with the requirements of 29 CFR Part 5 and Part 30 and shall be in conformity with Executive Order 11246, entitled “Equal Employment Opportunity”, Copeland, “Anti-Kickback” Act (40 U.S.C. 3145, 29 C.F.R. Part 3), the Davis-Bacon and Related Acts (40 U.S.C. 3141-3148, 29 C.F.R. Parts 1,3, and 5), the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 et seq.), and all other applicable Federal, State, and local laws and regulations pertaining to labor standards, insofar as those acts apply to the performance of this Agreement. Proposer is also responsible for ensuring that all subcontractors comply with the requirements of 29 CFR Part 5 and Part 30 and shall be in conformity with Executive Order 11246, entitled “Equal Employment Opportunity”, Copeland “Anti-Kickback” Act, the Davis-Bacon and Related Acts (29 CFR Parts 1, 3 and 5), the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 et seq.), and all other applicable Federal, State, and local laws and regulations pertaining to labor standards, insofar as those acts apply to the performance of this Agreement.

65. PROCUREMENT LAWS

- a. Proposer shall comply with all applicable local, State, and Federal laws, rules, and regulations.
- b. If this contract is made pursuant to a federal award, then Contractor acknowledges that the contract is subject, without limitation, to applicable provisions within 2 C.F.R. Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. Contractor shall comply with applicable provisions within 2 C.F.R., Sections 200.319 through 200.326, including but not limited to the following:
 - 1.) **Equal Employment Opportunity**, 41 C.F.R. Part 60-1.4(b) (applicable to federally assisted construction contracts).

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

- (a) During the performance of this contract, the contractor agrees as follows:
- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national original, disability, or veteran status. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, national original, disability or veteran status. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
 - (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national original, disability, or veteran status.
 - (3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
 - (4) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and by rules, regulations, and relevant orders of the Secretary of Labor.
 - (5) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to contractor's books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
 - (6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
 - (7) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.
- 2.) **Small and minority business, women's business enterprises, and labor surplus area firms (2 C.F.R. § 200.321).** The County is required to take affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible. This includes requiring the prime contractor, if subcontracts are to be

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

let in the performance of this contract, to itself take affirmative steps in letting the subcontract. Accordingly, if subcontracts are to be let in the performance of this contract, the contractor must take affirmative steps in the letting of the subcontract(s), which must include:

- (a) placing qualified small and minority businesses and women’s business enterprises on solicitation lists;
- (b) assuring that small and minority businesses, and women’s business enterprises are solicited whenever they are potential sources;
- (c) dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women’s business enterprises; and
- (d) using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

In accordance with FEMA procurement guidance:

A small business is a business that is independently owned and operated, not dominant in the field of operation in which it is bidding on Galveston County contracts and qualified as a small business under the Small Business Administration criteria and size standards at 13 C.F.R. Part 121.

A women’s business enterprise is a business enterprise that is: (a) at least 51 percent owned by one or more women or, in the case of a publicly owned business, at least 51 percent of the stock is owned by one or more women; and (b) whose management and daily operations are controlled by one or more women.

A minority business is a business that is (a) at least 51 percent owned by one or more minority group members or, in the case of a publicly owned business, at least 51 percent of the stock is owned by one or more minority group members; and (b) whose management and daily operations are controlled by one or more minority group members.

- 3.) **Davis-Bacon Act as amended (40 U.S.C. 3141-3148).** When required by Federal program legislation, all prime construction contracts in excess of \$2,000 must include a provision for compliance with the Davis-Bacon Act as supplemented by the Department of Labor regulations (29 C.F.R. Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”). In accordance with the statute, contractor must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity (the County) must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be condition upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contract must also include a provision for compliance with the Copeland Anti-Kickback Act (40 U.S.C. § 3145) as supplemented by the Department of Labor regulations (29 C.F.R. Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”).
- 4.) **Compliance with the Copeland “Anti-Kickback” Act.** Contractor is prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which the person is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. “Whoever, by force, intimidation, or threat of procuring dismissal from employment, or by any other manner whatsoever induces any person employed in the construction, prosecution, completion or repair of any public building, public work, or building or work financed in whole or in part by loans or grants from the United States, to give up any part of the compensation to which he is entitled under his contract of employment, shall be fined under this title [Title 18, U.S.C.] or imprisoned not more than five years, or both.” 18 U.S.C. § 874.
 - (a) Contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. Part 3 as may be applicable, which are incorporated by reference into this contract.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

- (b) The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as the Federal awarding agency may be appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.
- (c) Breach. A breach of the contract clause above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

5.) Contract Work Hours and Safety Standards Act.

- (a) Where applicable, all contracts awarded by the County in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. §§ 3702 and 3704, as supplemented by the Department of Labor regulations at 29 C.F.R. Part 5. Under 40 U.S.C. § 3702 of the Contract Work Hours and Safety Standards Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.S. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchase of supplies or material or articles ordinarily available on the open market, or contractors for transportation or transmission of intelligence.
- (b) Compliance with the Contract Work Hours and Safety Standards Act.
 - (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
 - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this subsection the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this subsection, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard work week of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this subsection.
 - (3) Withholding for unpaid wages and liquidated damages. The awarding Federal agency, State agency, or the County shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this subsection.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this subsection and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this subsection.

6.) Rights to Inventions Made Under a Contractor Agreement.

- (a) If the Federal award meets the definition of “funding agreement” under 37 C.F.R. § 401.2(a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under the “funding agreement,” the recipient or subrecipient must comply with the requirements of 37 C.F.R. Part 401, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” and any implementing regulations issued by the awarding agency.
- (b) Stafford Act Disaster Grants. This requirement does not apply to Public Assistance, Hazard Mitigation Grant Program, Crisis Counseling Assistance and Training Grant program, Disaster Case Management Grant Program, and Federal Assistance to Individuals and Households – Other Needs Assistance Grant Program, as FEMA awards under these programs do not meet the definition of “funding agreement.”
- (c) The regulations and 37 C.F.R. § 401.2(a) currently defines “funding agreement” as any contract, grant, or cooperative agreement entered into between any Federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal government. This term also includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as defined in the first sentence of this paragraph.

7.) Clean Air Act (42 U.S.C. §§ 7401 – 7671q) and the Federal Water Pollution Control Act 933 U.S.C. §§ 1251-1387), as amended.

- (a) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401, et seq., and agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Contract Act, as amended, 33 U.S. C. § 1251, et seq.
- (b) The contractor agrees to report each violation of the Clean Air Act and/or the Federal Water Pollution Control Act to the Federal awarding agency, the State agency administering the grant, and the Regional Office of the Environmental Protection Agency (EPA) and understands and agrees that the Federal awarding agency, the State agency, and the EPA will, in turn, report each violation as required to assure notification to Galveston County, the Federal Emergency Management Agency, and the appropriate EPA Regional Office.

8.) Debarment and Suspension (Executive Orders 12549 and 12689). A contract award must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 C.F.R. Part 180 that implement Executive Orders 12549 and 12689. The Contractor is required to verify that none of the contractor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

Contractor must comply with 2 C.F.R. Part 180, Subpart C and 2 C.F.R. Part 3000, Subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into. Proposer agrees to comply with the requirements of 2 C.F.R. Part 180, Subpart C, and 2 C.F.R. Part 3000, Subpart C, while this offer is valid and through the period of any contract that may arise from this offer. The proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

9.) Procurement of Recovered Materials.

- (a.) A non-Federal entity that is a State agency or agency of a political subdivision of the State and its contractors must comply with Section 6002 of the Solid Waste Disposal Act, Public Law No. 89-272 (1965) (codified as amended by the Resource Conservation and Recovery Act at 42 U.S.C. § 6962).
- (b.) In the performance of this contract, the contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired—
 - (1) Competitively within a timeframe providing for compliance with the contract performance schedule;
 - (2) Meeting contract performance requirements; or
 - (3) At a reasonable price.
- (c) Information about this requirement is available at EPA’s Comprehensive Procurement Guidelines website, <http://www.epa.gov/cpg/>. The list of EPA-designated items is available at <https://www.epa.gov/cpg/products.htm>.

In the event of any discrepancy between the provisions in this Section 63 of General Provisions and provisions on the same subject elsewhere within this procurement, the most stringent shall control.

66. ENERGY EFFICIENCY (42 U.S.C. 6201 and 2 CFR 200 APPENDIX II (H))

Contractor must comply with the mandatory standards and policies relating to energy efficiency, which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201). Contractor must include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract.

67. LEAD AND ASBESTOS

If this Invitation to Bid involves remediation, demolition, reconstruction, rehabilitation, repair, or construction, or other applicable activities, the Contractor shall be responsible for performing investigations of lead and asbestos containing materials, and any required lead and asbestos abatement in compliance with Federal, State, and local laws, rules, regulations, ordinances and orders, relating to lead abatement and asbestos abatement as applicable, including but not limited to the Texas Asbestos Health Protection Act, codified as Chapter 1954 of the Occupations Code; the Texas Asbestos Health Protection Regulations, located at Title 25, Part 1, Chapter 295, Subchapter C of the Texas Administrative Code; Chapter 1955 of the Texas Occupations Code (lead-based paint abatement); the Texas Environmental Lead Reduction regulations, located at Title 25, Part 1, Chapter 295, Subchapter I of the Texas Administrative Code; the federal National Emission Standards for Asbestos regulations, located at Title 40, Part 61, Subpart M of the Code of Federal Regulations, and the National Emission Standards for Hazardous Air Pollutants. Contractor shall perform such inspections, encapsulation, remediation or other actions as required by federal, State, or local requirements in accordance with the federal Environmental Protection Agency (EPA), Texas Department of State Health Services (TXDSHS), and Texas Commission on Environmental Quality (TCEQ) requirements.

68. USE OF DHS SEAL, LOGO, AND FLAGS PROHIBITED WITHOUT PRIOR APPROVAL

Contractor must obtain permission from the U.S. Department of Homeland Security financial assistance office (DHS FAO) **prior** to using DHS seals(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials, including use of the United States Coast Guard seal, logo, crests or reproductions of flags or likenesses of Coast Guard Officials.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

69. FEDERAL GOVERNMENT NOT A PARTY

Contractor acknowledges that the Federal Government is not a party to the contract and is not subject to any obligations or liabilities to Galveston County, contractor, or any other party pertaining to any matter resulting from the contract.

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

In contracts funded through Federal grants, Contractor acknowledges that 31 U.S.C. Chapter 38, Administrative Remedies for False Claims and Statements (31 U.S.C. § 3801, et seq.) and the implementing regulations thereunder, 49 C.F.R. Part 79, apply to Contractors actions pertaining to the contract.

71. ACKNOWLEDGMENT OF GOVERNMENT RECORD

Proposer acknowledges that its submission in this Invitation to Bids, including its Bid, certifications, affidavits, Vendor Forms (i.e., PEID, W-9, CIQ, etc.) constitutes government records under Chapter 37 of the Texas Penal Code.

72. COMPLIANCE WITH GALVESTON COUNTY PURCHASING POLICIES AND PROCEDURES

Proposer acknowledges, by its submission in this Invitation to Bids, that it shall comply with the Galveston County Purchasing Policies & Procedures Manual approved by Order of the Galveston County Commissioners' Court on March 7, 2018.

73. ENTIRETY OF AGREEMENT AND MODIFICATION

This contract contains the entire agreement between the parties. Any prior agreement, promise, negotiation or representation not expressly set forth in this contract has no force or effect. Any subsequent modification to this contract must be in writing, signed by both parties.

An official representative, employee, or agent of the County does not have the authority to modify or amend this contract except pursuant to specific authority to do so granted by the Galveston County Commissioners' Court.

74. NOTICE

All notices or other communications required or permitted under this contract shall be in writing and shall be deemed to have been duly given if delivered personally in hand, transmitted by facsimile, or mailed certified mail, return receipt requested with proper postage affixed and addressed to the appropriate party at the following address or at such other address as may have been previously given in writing to the parties (proposer shall provide its notice information with its Bid submission). If mailed, the notice shall be deemed delivered when actually received, or if earlier, on the third day following deposit in a United States Postal Service post office or receptacle, duly certified, return receipt requested, with proper postage affixed. If delivered in person, notice shall be deemed delivered when receipted for by, or actually received by, the receiving Party. If transmitted by facsimile, notice shall be deemed delivered when receipt of such transmission is acknowledged.

**GENERAL PROVISIONS – INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

To the County at:

Hon. Mark Henry,
County Judge of Galveston County
722 Moody (21st Street), Second (2nd) Floor
Galveston, Texas 77550
Fax: (409) 765-2653

With copies to:

Rufus Crowder, CPPO CPPB,
Galveston County Purchasing Agent
722 Moody (21st Street), Fifth (5th) Floor
Galveston, Texas 77550
Fax: (409) 621-7997

To the Contractor at:

(Proposer to provide its contact name, address, and facsimile number for notice under the contract.)

End of General Provisions Section

**SPECIAL PROVISIONS
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

TABLE OF CONTENTS

A.	PURPOSE	1
B.	DEFINITIONS	1
C.	BID SURETY	1
D.	PERFORMANCE AND PAYMENT BONDS	1
E.	DAVIS-BACON WAGE RATES	1
F.	BEST AND FINAL OFFERS (BAFO)	1
G.	PROCUREMENT TIMELINE	2
H.	PRE-BID CONFERENCE	2
I.	PERSONNEL TO CONTACT	2-3
J.	PROGRAM ADMINISTRATION & CONTRACT MANAGEMENT	3
K.	TYPE OF CONTRACT	4
L.	COLLATERAL CONTRACT	4
M.	LABOR	4
N.	INSURANCE	4-5
O.	EXCEPTIONS	5

**SPECIAL PROVISIONS
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

The Special Provisions and the General Provisions of this Invitation to Bid and the Exhibits attached hereto are made a part of this agreement between the Parties. In the event of a conflict between the General Provisions and the Special Provisions, the terms of the Special Provisions shall control.

A. PURPOSE

Galveston County is seeking a vendor to construct a two-lane road consisting of concrete paving, ADA ramps, sidewalks, roadside ditches, storm sewer, pavement markings, traffic control, traffic signage, and a traffic signal. The limits are from Hanson Road in Clear Lake Shores, Texas to FM 518 in Kemah, Texas.

The engineer's construction cost estimate to complete this project is \$860,000.00.

B. DEFINITIONS (As mentioned in FAR Subpart 52.2—Text of Provisions and Clauses)

52.202-1 Definitions.

Definitions (Nov 2013)

When a solicitation provision or contract clause uses a word or term that is defined in the Federal Acquisition Regulation (FAR), the word or term has the same meaning as the definition in FAR [2.101](#) in effect at the time the solicitation was issued, unless—

- (a) The solicitation, or amended solicitation, provides a different definition;
- (b) The contracting parties agree to a different definition;
- (c) The part, subpart, or section of the FAR where the provision or clause is prescribed provides a different meaning; or
- (d) The word or term is defined in FAR [Part 31](#), for use in the cost principles and procedures

C. BID SURETY

A Bid surety/bond ***is a requirement*** of this solicitation.

D. PERFORMANCE AND PAYMENT BONDS

Performance and Payment Bonds ***are a requirement*** of this solicitation.

E. DAVIS-BACON WAGE RATES

Attention is called to the fact that not less than, the federally determined prevailing (Davis-Bacon and Related Acts) wage rate, as issued by the Office of Rural Community Affairs and contained in the contract documents, must be paid on this project. In addition, the successful bidder must ensure that employees and applicants for employment are not discriminated against because of race, color, religion, sex age or national origin.

F. BEST AND FINAL OFFERS (BAFO)

The Best and Final Offer process **is not applicable** to this solicitation.

**SPECIAL PROVISIONS
DANIEL DROR AVENUE
GALVESTON COUNTY**

G. PROCUREMENT TIMELINE

A timeline for this Bid and initial process is included below. Galveston County reserves the right to change these dates and will notify Bidders of any changes:

Advertise BID (first date of publication)	Friday, July 16, 2021
Advertise BID (second date of publication)	Friday, July 23, 2021
Pre-Bid Conference	Tuesday, July 27, 2021 at 11:00 a.m.
Deadline for Questions & Inquiries	Friday, July, 30, 2021 by 5:00 p.m.
Bids due from public/Bid Opening	Thursday, August 12, 2021 at 2:15 p.m.

H. PRE-BID CONFERENCE:

A non-mandatory pre-bid conference will be held on Tuesday, July 27, 2021 at 11:00 a.m.

Potential vendors can choose either a virtual pre-bid conference or an in person pre-bid conference. Instructions for both are listed below:

Virtual Pre-Bid Conference:

Due to the COVID-19 pandemic, the County of Galveston has instituted measures to guard against the spread of the virus. This includes the prohibition of in-person meetings, social distancing, and stay-at-home requirements for employees.

The Pre-Bid Conference shall take place via video/tele-conference and the instructions are listed below and on the County's Purchasing website:

Minimum System Requirements for Video Conferencing:

1. High-resolution webcam;
2. Computer processing minimum: 2 GB of RAM and a quad-core processor;
3. Network bandwidth: 1 Mbps is sufficient for 15 fps at 720p resolution;

Calling from a mobile device:

1. Front facing camera;
2. In ear headphone with built in mic

Instructions for Video Conferencing:

1. [Click here](https://guest.lifesize.com/1907077) or navigate to <https://guest.lifesize.com/1907077>
2. **Enter attendee name, attendee company name, and email address (for contact and addenda issuance purposes)**
3. Click the Terms of Service and Privacy Policy checkbox;
4. Click Join Meeting

***Note - be sure to enable audio and video.**

In-Person Pre-Bid Conference:

A non-mandatory pre-bid conference will be held on **Tuesday, July 27, 2021 at 11:00 a.m.** at the Galveston County Courthouse, Purchasing Department, 722 Moody (21st Street), Fifth (5th) Floor, Galveston, Texas 77550.

**SPECIAL PROVISIONS
DANIEL DROR AVENUE
GALVESTON COUNTY**

I. PERSONNEL TO CONTACT

Bidders desiring an explanation or interpretation relative to this solicitation must request it in writing. Oral explanations or instructions will not be binding. Any information given to a Bidder, which in the opinion of the County affects all responders or would be prejudicial to other Bidders if not communicated, shall be furnished to all Bidders as an addendum to the solicitation. Bidders **must** direct all inquiries to the following:

**Rufus G. Crowder, CPPO CPPB
Purchasing Agent
722 21st Street (Moody)
Galveston, Texas 77550
e-mail: purchasing.bids@co.galveston.tx.us**

Bidders must e-mail their requests (with the subject line “**Daniel Dror Avenue– ITB# B211031– Questions**”) for additional information and/or clarification to the address listed above. The request must include the Bidder’s name and the BID number and title. ***Any request for additional information or clarification must be received in writing no later than seven (7) calendar days prior to the Bid due date.*** Late requests or those not delivered to the proper address may not receive a reply. Bidders shall not attempt to contact the County by any other means. The Purchasing Agent’s Office shall post the answers to the County website from the procurement web page and via addendum.

The County will issue responses to inquiries and any other corrections or amendments, it deems necessary, in the form of a written addendum, issued prior to the Bid Submission Date. The County, at its sole discretion, may not issue a response to an RFI submittal. Bidders should not rely on any oral or written representations, statements, or explanations, other than those made in this BID or in any written addendum to this BID. Where there appears to be conflict between the BID and any issued addenda, the last addendum issued will prevail. Addenda will be posted and made available on the County’s procurement web page. It is the Bidder’s sole responsibility to ensure receipt of all addenda prior to submitting its Bid. All Bidders should check the County’s procurement web page for all addenda prior to submitting a response. The County’s procurement web page is located at www1.galvestoncountytexas.gov/pu/Pages/OpenSolicitations.aspx.

The Bidder must acknowledge the receipt of all addenda on the forms provided. In the event a Bidder fails to acknowledge receipt of such addenda, the County may, at its sole discretion, determine that such failure to acknowledge any or all addenda does not materially affect the Bid and waive the acknowledgement of one or more addenda.

Bidders who submit inquiries *after* the deadline date for receipt of questions indicated on the Procurement Timeline, risk that its response in the procurement will not be responsive or competitive because the County is not able to respond before the Bid receipt date or in sufficient time for the Bidder to prepare a responsive or competitive submittal.

All questions and responses as posted on the County website pertaining to this BID are considered an addendum to, and part of, this BID. Each Bidder shall be responsible to monitor the County website for new or revised BID information. The County shall not be bound by any verbal information nor shall it be bound by any written information that is not either contained within the BID or formally issued as an addendum by the Purchasing Agent’s Office.

**SPECIAL PROVISIONS
DANIEL DROR AVENUE
GALVESTON COUNTY**

J. PROGRAM ADMINISTRATION & CONTRACT MANAGEMENT

The Program Administrator/Contract Manager that will manage the work to be performed under the resultant contract for the purpose of this bid is:

**Michael Shannon
Galveston County Engineer
722 Moody, (21st St.), 1st Floor
Galveston, TX 77550**

K. TYPE OF CONTRACT

It is the intent of this solicitation to enter into a contract that meets federal guidelines. It is imperative that all responders seeking a contract under this solicitation effort must familiarize and adhere to the procurement standards as referenced in 2 C.F.R. Part 200, Sections 200.317-200.326, and Appendix II, 2 C.F.R. Part 200. Sections 200.317–200.326 and Appendix II are attached hereto as **Attachment A and REQUIRED CONTRACT PROVISIONS are attached hereto as ATTACHMENT B.**

The resultant contract consists of the following documents: Invitation to Bid, General Provisions, Special Provisions, General Terms and Conditions (including specifications, drawings, and addenda), Bidder's Bid, Bid Sheets, contract award, and any other documents referenced herein or attached hereto for the work. Collectively these documents may also be referred to as the Plans and Specifications.

In an effort to satisfy cost reasonableness responsibilities at the time of any extension period, the County of Galveston reserves the right to obtain additional quotes and current pricing information from the successful contractor and other contractors to perform the work as stated per the specification listed herein and in the resultant. The solicited results may be used by the County to determine if the contract extensions will be considered or other service options be utilized.

L. COLLATERAL CONTRACT

The County reserves the right to provide by separate contract or otherwise, in such manner as not to delay its programs or damage said Contractor, all labor and material essential to the completion of the work that is not included in this contract.

Award prices include all royalties and costs arising from patents, trademarks, and copyrights in any way involved in the work. Whenever the Awardee is required or desires to use any design, device, material or process covered by letters of patent or copyright, the Awardee shall indemnify and save harmless the County, its officers, agents and employees from any and all claims for infringement by reason of the use of any such patented design, tool, material, equipment, or process, to be performed under the contract, and shall indemnify the County its officers, agents, and employees for any costs, expenses and damages which may be incurred by reason of any infringement at any time during the prosecution or after the completion of the work.

M. LABOR

Contractor is encouraged to use local labor, but not at the expense of poor workmanship and higher cost. Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. Contractor agrees to post in a conspicuous place a notice setting forth provisions of this non-discrimination clause.

**SPECIAL PROVISIONS
DANIEL DROR AVENUE
GALVESTON COUNTY**

N. INSURANCE

Bidder must submit, with its response, a current certificate of insurance evidencing coverage in the amounts specified below or greater. In lieu of submitting a certificate of insurance, Respondents may submit a notarized statement from an insurance company authorized to conduct business in the State of Texas guaranteeing that Respondent has such insurance. Provided however, that successful Respondent(s) shall be required to provide a current certificate of insurance to the Galveston County Purchasing Agent's Office before Respondent commences any work hereunder. **Insurance shall be placed with insurers having an A.M. Best's rating of no less than A.** Such insurance must be issued by a casualty company authorized to do business in the State of Texas, and in standard form approved by the Board of Insurance Commissioners of the State of Texas, with coverage provisions insuring the public from loss or damage that may arise to any person or property by reason of services rendered by Contractor.

Galveston County shall be listed as an additional insured on each policy and all certificates of insurance and Contractor shall provide Galveston County with no less than thirty (30) calendar days prior notice of any changes to the policy during the contractual period.

Certificates of Insurance, fully executed by a licensed representative of the insurance company written or countersigned by an authorized Texas state agency, shall be filed with the County Purchasing Agent within ten (10) calendar days of the execution of this Agreement as written proof of such insurance and further provided that Contractor shall not commence work under this Agreement until Contractor has obtained all insurance required herein, provided written proof as required herein, and received written notice to proceed issued from the County Purchasing Agent. **Failure to provide such evidence of insurance within the ten (10) calendar day period shall constitute an event of default.**

Workers' Compensation Insurance. Respondent shall carry in full force Workers' Compensation Insurance Policy(ies), if there is more than one employee, for all its employees, including but not limited to full time, part time, and emergency employees employed by the Contractor.

Commercial General Liability. Respondent shall carry in full force commercial general liability insurance with a limit of not less than \$1,000,000 each occurrence and \$2,000,000 in the aggregate. The Policy shall, minimally, cover liability for bodily injury, personal injury, and property damage.

Business Automobile Liability. Respondent shall carry in full force business automobile liability coverage with a combined bodily injury/property damage limit of not less than \$1,000,000 each accident. The policy shall cover liability arising from the operation of licensed vehicles by policyholder.

Professional Liability. Respondent shall carry in full force professional liability insurance with limits of not less than \$1,000,000.00.

Subrogation Waiver. Contractor and Contractor's insurance carrier shall waive any and all rights to subrogation against Galveston County in regard to any suit or claim arising out of personal injury or property damage resulting from Contractor's performance under this Agreement.

O. EXCEPTIONS

Any exceptions to Bid conditions should be listed on a separated sheet of paper, attached to Bid submittals and submitted with Bid at the specified date and time of Bid opening.

ATTACHMENT A

**INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

**PROCUREMENT STANDARDS
2 C.F.R. §§ 200.317 – 200.326 & 2 C.F.R. PART 200, APPENDIX II**

TABLE OF CONTENTS

2 C.F.R. § 200.317. Procurements by states.	2
2 C.F.R. § 200.318. General procurement standards.	2-3
2 C.F.R. § 200.319. Competition.	4-5
2 C.F.R. § 200.320. Methods of procurement to be followed.....	5-7
2 C.F.R. § 200.321. Contracting with small and minority businesses, women's business enterprises, and labor surplus area firms.....	7
2 C.F.R. § 200.322. Procurement of recovered materials.	8
2 C.F.R. § 200.323. Contract cost and price.	8
2 C.F.R. § 200.324. Federal awarding agency or pass-through entity review.	8-9
2 C.F.R. § 200.325. Bonding requirements.	9-10
2 C.F.R. § 200.326. Contract provisions.....	10
2 C.F.R. Part, 200, Appendix II	11-14

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

2 C.F.R. § 200.317. Procurements by states.

When procuring property and services under a Federal award, a state must follow the same policies and procedures it uses for procurements from its non-Federal funds. The state will comply with §200.322 Procurement of recovered materials and ensure that every purchase order or other contract includes any clauses required by section §200.326 Contract provisions. All other non-Federal entities, including subrecipients of a state, will follow §§ 200.318 General procurement standards through 200.326 Contract provisions.

69 FR 26280, May 11, 2004; 78 FR 78608, Dec. 26, 2013

2 C.F.R. § 200.318. General procurement standards.

(a) The non-Federal entity must use its own documented procurement procedures which reflect applicable State, local and tribal laws and regulations, provided that the procurements conform to applicable Federal law and the standards identified in this part.

(b) Non-Federal entities must maintain oversight to ensure that contractors perform in accordance with the terms, conditions, and specifications of their contracts or purchase orders.

(c)

(1) The non-Federal entity must maintain written standards of conduct covering conflicts of interest and governing the actions of its employees engaged in the selection, award and administration of contracts. No employee, officer, or agent may participate in the selection, award, or administration of a contract supported by a Federal award if he or she has a real or apparent conflict of interest. Such a conflict of interest would arise when the employee, officer, or agent, any member of his or her immediate family, his or her partner, or an organization which employs or is about to employ any of the parties indicated herein, has a financial or other interest in or a tangible personal benefit from a firm considered for a contract. The officers, employees, and agents of the non-Federal entity may neither solicit nor accept gratuities, favors, or anything of monetary value from contractors or parties to subcontracts. However, non-Federal entities may set standards for situations in which the financial interest is not substantial or the gift is an unsolicited item of nominal value. The standards of conduct must provide for disciplinary actions to be applied for violations of such standards by officers, employees, or agents of the non-Federal entity.

(2) If the non-Federal entity has a parent, affiliate, or subsidiary organization that is not a state, local government, or Indian tribe, the non-Federal entity must also maintain written standards of conduct covering organizational conflicts of interest. Organizational conflicts of interest means that because of relationships with a parent company, affiliate, or subsidiary organization, the non-Federal entity is unable or appears to be unable to be impartial in conducting a procurement action involving a related organization.

(d) The non-Federal entity's procedures must avoid acquisition of unnecessary or duplicative items. Consideration should be given to consolidating or breaking out procurements to obtain a more economical purchase. Where appropriate, an analysis will be made of lease versus purchase alternatives, and any other appropriate analysis to determine the most economical approach.

ATTACHMENT A

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

(e) To foster greater economy and efficiency, and in accordance with efforts to promote cost-effective use of shared services across the Federal Government, the non-Federal entity is encouraged to enter into state and local intergovernmental agreements or inter-entity agreements where appropriate for procurement or use of common or shared goods and services.

(f) The non-Federal entity is encouraged to use Federal excess and surplus property in lieu of purchasing new equipment and property whenever such use is feasible and reduces project costs.

(g) The non-Federal entity is encouraged to use value engineering clauses in contracts for construction projects of sufficient size to offer reasonable opportunities for cost reductions. Value engineering is a systematic and creative analysis of each contract item or task to ensure that its essential function is provided at the overall lower cost.

(h) The non-Federal entity must award contracts only to responsible contractors possessing the ability to perform successfully under the terms and conditions of a proposed procurement. Consideration will be given to such matters as contractor integrity, compliance with public policy, record of past performance, and financial and technical resources. See also § 200.213 Suspension and debarment.

(i) The non-Federal entity must maintain records sufficient to detail the history of procurement. These records will include, but are not necessarily limited to the following: rationale for the method of procurement, selection of contract type, contractor selection or rejection, and the basis for the contract price.

(j)

(1) The non-Federal entity may use a time and materials type contract only after a determination that no other contract is suitable and if the contract includes a ceiling price that the contractor exceeds at its own risk. Time and materials type contract means a contract whose cost to a non-Federal entity is the sum of:

(i) The actual cost of materials; and

(ii) Direct labor hours charged at fixed hourly rates that reflect wages, general and administrative expenses, and profit.

(2) Since this formula generates an open-ended contract price, a time-and-materials contract provides no positive profit incentive to the contractor for cost control or labor efficiency. Therefore, each contract must set a ceiling price that the contractor exceeds at its own risk. Further, the non-Federal entity awarding such a contract must assert a high degree of oversight in order to obtain reasonable assurance that the contractor is using efficient methods and effective cost controls.

(k) The non-Federal entity alone must be responsible, in accordance with good administrative practice and sound business judgment, for the settlement of all contractual and administrative issues arising out of procurements. These issues include, but are not limited to, source evaluation, protests, disputes, and claims. These standards do not relieve the non-Federal entity of any contractual responsibilities under its contracts. The Federal awarding agency will not substitute its judgment for that of the non-Federal entity unless the matter is

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

primarily a Federal concern. Violations of law will be referred to the local, state, or Federal authority having proper jurisdiction.

78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75885, Dec. 19, 2014; 80 FR 43309, July 22, 2015; 80 FR 45395, July 30, 2015

2 C.F.R. § 200.319. **Competition.**

(a) All procurement transactions must be conducted in a manner providing full and open competition consistent with the standards of this section. In order to ensure objective contractor performance and eliminate unfair competitive advantage, contractors that develop or draft specifications, requirements, statements of work, or invitations for bids or requests for proposals must be excluded from competing for such procurements. Some of the situations considered to be restrictive of competition include but are not limited to:

- (1) Placing unreasonable requirements on firms in order for them to qualify to do business;
- (2) Requiring unnecessary experience and excessive bonding;
- (3) Noncompetitive pricing practices between firms or between affiliated companies;
- (4) Noncompetitive contracts to consultants that are on retainer contracts;
- (5) Organizational conflicts of interest;
- (6) Specifying only a “brand name” product instead of allowing “an equal” product to be offered and describing the performance or other relevant requirements of the procurement; and
- (7) Any arbitrary action in the procurement process.

(b) The non-Federal entity must conduct procurements in a manner that prohibits the use of statutorily or administratively imposed state, local, or tribal geographical preferences in the evaluation of bids or proposals, except in those cases where applicable Federal statutes expressly mandate or encourage geographic preference. Nothing in this section preempts state licensing laws. When contracting for architectural and engineering (A/E) services, geographic location may be a selection criterion provided its application leaves an appropriate number of qualified firms, given the nature and size of the project, to compete for the contract.

(c) The non-Federal entity must have written procedures for procurement transactions. These procedures must ensure that all solicitations:

- (1) Incorporate a clear and accurate description of the technical requirements for the material, product, or service to be procured. Such description must not, in competitive procurements, contain features which unduly restrict competition. The description may include a statement of the qualitative nature of the material, product or service to be procured and, when necessary, must set forth those minimum essential characteristics and standards to which it must conform if it is to satisfy its intended use. Detailed product specifications should be

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

avoided if at all possible. When it is impractical or uneconomical to make a clear and accurate description of the technical requirements, a “brand name or equivalent” description may be used as a means to define the performance or other salient requirements of procurement. The specific features of the named brand which must be met by offers must be clearly stated; and

(2) Identify all requirements which the offerors must fulfill and all other factors to be used in evaluating bids or proposals.

(d) The non-Federal entity must ensure that all prequalified lists of persons, firms, or products which are used in acquiring goods and services are current and include enough qualified sources to ensure maximum open and free competition. Also, the non-Federal entity must not preclude potential bidders from qualifying during the solicitation period.

78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75885, Dec. 19, 2014

2 C.F.R. § 200.320. **Methods of procurement to be followed.**

The non-Federal entity must use one of the following methods of procurement.

(a) Procurement by micro-purchases. Procurement by micro-purchase is the acquisition of supplies or services, the aggregate dollar amount of which does not exceed the micro-purchase threshold (§200.67 Micro-purchase). To the extent practicable, the non-Federal entity must distribute micro-purchases equitably among qualified suppliers. Micro-purchases may be awarded without soliciting competitive quotations if the non-Federal entity considers the price to be reasonable.

(b) Procurement by small purchase procedures. Small purchase procedures are those relatively simple and informal procurement methods for securing services, supplies, or other property that do not cost more than the Simplified Acquisition Threshold. If small purchase procedures are used, price or rate quotations must be obtained from an adequate number of qualified sources.

(c) Procurement by sealed bids (formal advertising). Bids are publicly solicited and a firm fixed price contract (lump sum or unit price) is awarded to the responsible bidder whose bid, conforming with all the material terms and conditions of the invitation for bids, is the lowest in price. The sealed bid method is the preferred method for procuring construction, if the conditions in paragraph (c)(1) of this section apply.

(1) In order for sealed bidding to be feasible, the following conditions should be present:

(i) A complete, adequate, and realistic specification or purchase description is available;

(ii) Two or more responsible bidders are willing and able to compete effectively for the business; and

(iii) The procurement lends itself to a firm fixed price contract and the selection of the successful bidder can be made principally on the basis of price.

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

(2) If sealed bids are used, the following requirements apply:

(i) Bids must be solicited from an adequate number of known suppliers, providing them sufficient response time prior to the date set for opening the bids, for local, and tribal governments, the invitation for bids must be publicly advertised;

(ii) The invitation for bids, which will include any specifications and pertinent attachments, must define the items or services in order for the bidder to properly respond;

(iii) All bids will be opened at the time and place prescribed in the invitation for bids, and for local and tribal governments, the bids must be opened publicly;

(iv) A firm fixed price contract award will be made in writing to the lowest responsive and responsible bidder. Where specified in bidding documents, factors such as discounts, transportation cost, and life cycle costs must be considered in determining which bid is lowest. Payment discounts will only be used to determine the low bid when prior experience indicates that such discounts are usually taken advantage of; and

(v) Any or all bids may be rejected if there is a sound documented reason.

(d) Procurement by competitive proposals. The technique of competitive proposals is normally conducted with more than one source submitting an offer, and either a fixed price or cost-reimbursement type contract is awarded. It is generally used when conditions are not appropriate for the use of sealed bids. If this method is used, the following requirements apply:

(1) Requests for proposals must be publicized and identify all evaluation factors and their relative importance. Any response to publicized requests for proposals must be considered to the maximum extent practical;

(2) Proposals must be solicited from an adequate number of qualified sources;

(3) The non-Federal entity must have a written method for conducting technical evaluations of the proposals received and for selecting recipients;

(4) Contracts must be awarded to the responsible firm whose proposal is most advantageous to the program, with price and other factors considered; and

(5) The non-Federal entity may use competitive proposal procedures for qualifications-based procurement of architectural/engineering (A/E) professional services whereby competitors' qualifications are evaluated and the most qualified competitor is selected, subject to negotiation of fair and reasonable compensation. The method, where price is not used as a selection factor, can only be used in procurement of A/E professional services. It cannot be used to purchase other types of services though A/E firms are a potential source to perform the proposed effort.

(e) [Reserved]

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

(f) Procurement by noncompetitive proposals. Procurement by noncompetitive proposals is procurement through solicitation of a proposal from only one source and may be used only when one or more of the following circumstances apply:

- (1) The item is available only from a single source;
- (2) The public exigency or emergency for the requirement will not permit a delay resulting from competitive solicitation;
- (3) The Federal awarding agency or pass-through entity expressly authorizes noncompetitive proposals in response to a written request from the non-Federal entity; or
- (4) After solicitation of a number of sources, competition is determined inadequate.

78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75885, Dec. 19, 2014; 80 FR 54409, Sept. 10, 2015

2 C.F.R. § 200.321. Contracting with small and minority businesses, women's business enterprises, and labor surplus area firms.

(a) The non-Federal entity must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible.

(b) Affirmative steps must include:

- (1) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- (2) Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
- (3) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
- (4) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;
- (5) Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce; and
- (6) Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in paragraphs (1) through (5) of this section.

69 FR 26280, May 11, 2004; 78 FR 78608, Dec. 26, 2013, unless otherwise noted

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

2 C.F.R. § 200.322. Procurement of recovered materials.

A non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75885, Dec. 19, 2014

2 C.F.R. § 200.323. Contract cost and price.

(a) The non-Federal entity must perform a cost or price analysis in connection with every procurement action in excess of the Simplified Acquisition Threshold including contract modifications. The method and degree of analysis is dependent on the facts surrounding the particular procurement situation, but as a starting point, the non-Federal entity must make independent estimates before receiving bids or proposals.

(b) The non-Federal entity must negotiate profit as a separate element of the price for each contract in which there is no price competition and in all cases where cost analysis is performed. To establish a fair and reasonable profit, consideration must be given to the complexity of the work to be performed, the risk borne by the contractor, the contractor's investment, the amount of subcontracting, the quality of its record of past performance, and industry profit rates in the surrounding geographical area for similar work.

(c) Costs or prices based on estimated costs for contracts under the Federal award are allowable only to the extent that costs incurred or cost estimates included in negotiated prices would be allowable for the non-Federal entity under Subpart E—Cost Principles of this part. The non-Federal entity may reference its own cost principles that comply with the Federal cost principles.

(d) The cost plus a percentage of cost and percentage of construction cost methods of contracting must not be used.

69 FR 26280, May 11, 2004; 78 FR 78608, Dec. 26, 2013, unless otherwise noted

2 C.F.R. § 200.324. Federal awarding agency or pass-through entity review.

(a) The non-Federal entity must make available, upon request of the Federal awarding agency or pass-through entity, technical specifications on proposed procurements where the Federal awarding agency or pass-through entity believes such review is needed to ensure that the item or service specified is the one being proposed for acquisition. This review generally will take place prior to the time the specification is incorporated into a solicitation document. However, if the non-Federal entity desires to have the review accomplished after a solicitation has been developed, the Federal awarding agency or pass-through entity may still review the specifications, with such review usually limited to the technical aspects of the proposed purchase.

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

(b) The non-Federal entity must make available upon request, for the Federal awarding agency or pass-through entity pre-procurement review, procurement documents, such as requests for proposals or invitations for bids, or independent cost estimates, when:

(1) The non-Federal entity's procurement procedures or operation fails to comply with the procurement standards in this part;

(2) The procurement is expected to exceed the Simplified Acquisition Threshold and is to be awarded without competition or only one bid or offer is received in response to a solicitation;

(3) The procurement, which is expected to exceed the Simplified Acquisition Threshold, specifies a "brand name" product;

(4) The proposed contract is more than the Simplified Acquisition Threshold and is to be awarded to other than the apparent low bidder under a sealed bid procurement; or

(5) A proposed contract modification changes the scope of a contract or increases the contract amount by more than the Simplified Acquisition Threshold.

(c) The non-Federal entity is exempt from the pre-procurement review in paragraph (b) of this section if the Federal awarding agency or pass-through entity determines that its procurement systems comply with the standards of this part.

(1) The non-Federal entity may request that its procurement system be reviewed by the Federal awarding agency or pass-through entity to determine whether its system meets these standards in order for its system to be certified. Generally, these reviews must occur where there is continuous high-dollar funding, and third party contracts are awarded on a regular basis;

(2) The non-Federal entity may self-certify its procurement system. Such self-certification must not limit the Federal awarding agency's right to survey the system. Under a self-certification procedure, the Federal awarding agency may rely on written assurances from the non-Federal entity that it is complying with these standards. The non-Federal entity must cite specific policies, procedures, regulations, or standards as being in compliance with these requirements and have its system available for review.

69 FR 26280, May 11, 2004; 78 FR 78608, Dec. 26, 2013, unless otherwise noted

2 C.F.R. § 200.325. Bonding requirements.

For construction or facility improvement contracts or subcontracts exceeding the Simplified Acquisition Threshold, the Federal awarding agency or pass-through entity may accept the bonding policy and requirements of the non-Federal entity provided that the Federal awarding agency or pass-through entity has made a determination that the Federal interest is adequately protected. If such a determination has not been made, the minimum requirements must be as follows:

(a) A bid guarantee from each bidder equivalent to five percent of the bid price. The "bid guarantee" must consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

a bid as assurance that the bidder will, upon acceptance of the bid, execute such contractual documents as may be required within the time specified.

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

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

69 FR 26280, May 11, 2004; 78FR 78608, Dec. 26, 2013, unless otherwise noted

2 C.F.R. § 200.326. Contract provisions.

The non-Federal entity's contracts must contain the applicable provisions described in Appendix II to Part 200—Contract Provisions for non-Federal Entity Contracts Under Federal Awards.

69 FR 26280, May 11, 2004; 78 FR 78608, Dec. 26, 2013, unless otherwise note

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

2 C.F.R. Part, 200, Appendix II

In addition to other provisions required by the Federal agency or non-Federal entity, all contracts made by the non-Federal entity under the Federal award must contain provisions covering the following, as applicable.

(A) Contracts for more than the simplified acquisition threshold currently set at \$150,000, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

(B) All contracts in excess of \$10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be affected and the basis for settlement.

(C) Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

(D) Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of \$2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

(E) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

(F) Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of “funding agreement” under 37 CFR §401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” the recipient or subrecipient must comply with the requirements of 37 CFR Part 401, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” and any implementing regulations issued by the awarding agency.

(G) Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended—Contracts and subgrants of amounts in excess of \$150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

(H) Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

(I) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)—Contractors that apply or bid for an award exceeding \$100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

(J) See §200.322 Procurement of recovered materials.

78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75888, Dec. 19, 2014

ATTACHMENT A

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

CONTRACT PROVISIONS (2 C.F.R. 200.327)

Two contract clauses were added to Appendix II of 2 C.F.R. Part 200. In addition to the previous contract clauses contained in the 2014 version of Appendix II of 2 C.F.R. Part 200, FEMA award recipient and subrecipient contracts and purchase orders must now include contract provisions for *Domestic Preferences for Procurements* (2 C.F.R. 200.322) and the *Prohibition on Contracting for Covered Telecommunications or Services* (2 C.F.R. 200.316)

DOMESTIC PREFERENCES FOR PROCUREMENTS (*All State and non-State entity purchase orders must adhere to the following*)

§ 200.322 Domestic preferences for procurements.

(a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.

(b) For purposes of this section:

(1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

PROHIBITION ON CONTRACTING FOR COVERED TELECOMMUNICATIONS OR SERVICES (*Effective August 13, 2020 for new, extended, or renewed procurements under all open FEMA awards*)

§ 200.216 Prohibition on certain telecommunications and video surveillance services or equipment.

(a) Recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:

(1) Procure or obtain;

(2) Extend or renew a contract to procure or obtain; or

(3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in [Public Law 115-232](#), section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

ATTACHMENT A

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

(i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

(ii) Telecommunications or video surveillance services provided by such entities or using such equipment.

(iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

(b) In implementing the prohibition under [Public Law 115-232](#), section 889, subsection (f), paragraph

(1), heads of executive agencies administering loan, grant, or subsidy programs shall prioritize available funding and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered communications equipment and services, to procure replacement equipment and services, and to ensure that communications service to users and customers is sustained.

(c) See [Public Law 115-232](#), section 889 for additional information.

(d) See also § 200.471.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

REQUIRED CONTRACT PROVISIONS

The Part 200 Uniform Requirements require that non-Federal entities' contracts contain the applicable provisions described in Appendix II to Part 200 — "Contract Provisions for Non-Federal Entity Contracts Under Federal Awards." Violations of law will be referred to the proper authority in the applicable jurisdiction. All Prime Contractors awarded contracts by Galveston County which are federally funded, in whole or in part, are required to comply with the provisions below. Additionally, Prime Contractors with Galveston County are required to include the provisions below in any contracts executed with subcontractors performing the scope of work and shall pass these requirements on to its subcontractors and third-party contractors, as applicable. In addition to other provisions required by the relevant Federal agency, State of Texas, or Galveston County, all contracts made by Galveston County under the Federal award shall contain provisions covering the following, as applicable.

TRANSACTIONS WITH TERRORIST ORGANIZATIONS PROHIBITED (Texas Government Code 2252.151, 2252.152)

Prohibition on contracts with certain companies per Government Code 2252.151 Definitions:

- (1) "**Company**" has the meaning assigned by Section 806.001.
- (2) "**Foreign terrorist organization**" means an organization designated as a foreign terrorist organization by the United States secretary of state as authorized by 8 U.S.C. Section 1189.
- (3) "**Governmental contract**" means a contract awarded by a governmental entity for general construction, an improvement, a service, or a public works project for a purchase of supplies, materials, or equipment. The term includes a contract to obtain a professional or consulting service subject to Government Code, Chapter 2254.
- (4) "**Governmental entity**" has the meaning assigned by Government Code, Section 2252.001.

Pursuant to Chapter 2252, Texas Government Code, Contractor shall certify that, at the time of execution of this Contract, neither the Contractor, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same (1) engages in business with Iran, Sudan, or any foreign terrorist organization as described in Chapters 806 or 807 of the Texas Government Code, or Subchapter F of Chapter 2252 of the Texas Government Code, or (2) is a company listed by the Texas Comptroller of Public Accounts under Sections 806.051, 807.051, or 2252.153 of the Texas Government Code.

ATTACHMENT B

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

VERIFICATION NOT TO BOYCOTT ISRAEL

Prohibition on contracts with companies boycotting Israel per Government Code 2271.001 Definitions:

- (1) "**Boycott Israel**" has the meaning assigned by Section 808.001.
- (2) "**Company**" has the meaning assigned by Section 808.001; except that the term does not include a sole proprietorship.
- (2) "**Governmental entity**" has the meaning assigned by Government Code, Section 2251.001.

PROVISION REQUIRED IN CONTRACT. (a) This section applies only to a contract that:

- (1) is between a governmental entity and a company with 10 or more full-time employees; and
 - (2) has a value of \$100,000 or more that is to be paid wholly or partly from public funds of the governmental entity.
- (b) A governmental entity may not enter into a contract with a company for goods or services unless the contract contains a written verification from the company that it:
- (1) does not boycott Israel; and
 - (2) will not boycott Israel during the term of the contract.

As required by GOVERNMENT CODE, CHAPTER 2271, **CONTRACTOR hereby verifies that it does not boycott Israel and will not boycott Israel throughout the term of this Agreement.** For the purposes of this verification, "Boycott Israel" means refusing to deal with, terminating business activities, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

ENERGY EFFICIENCY (42 U.S.C. 6201 and 2 CFR 200 APPENDIX II (H))

Contractor must comply with the mandatory standards and policies relating to energy efficiency, which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201). Contractor must include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

ACCESS TO RECORDS & RECORD RETENTION (2 CFR 200.336)

Contractor must provide Galveston County, the State of Texas, the Texas General Land Office (GLO), the U.S. Department of Housing and Urban Development (HUD), the FEMA Administrator, the Inspectors General, the Comptroller General of the United States, or any of their pass-through entities or authorized representatives access to any books, documents, papers, and records of the Contractor and its subcontractors which are directly pertinent to this contract/project for the purposes of making/responding to audits, examinations, excerpts, and transcriptions. The right also includes timely and reasonable access to the Contractor's personnel for the purpose of interview and discussion related to such documents. Contractor must keep records within Galveston County or note in bid that records will be available within the boundaries of Galveston County to those representatives within twenty-four (24) hours of request by the County. Contractor must maintain all records pertaining to the project for seven (7) years after receiving final payment and after all other pending matters have been closed.

ACCESSIBILITY (24 CFR 570.614) & SECTION 504 (29 U.S.C. Section 794 and 24 CFR Parts 8-9)

Contractor shall comply with all federal, state and local laws and regulations which prohibit recipients of federal funding from discriminating against individuals with disabilities. Applicable laws and regulations with which Contractor shall comply shall include, but are not limited to, the following: Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. Section 794) (24 CFR Parts 8-9); Title II of the Americans with Disabilities Act of 1990; the Architectural Barriers Act of 1968 (42 U.S.C. 4151-4157); the Uniform Federal Accessibility Standards (Appendix A to 24 CFR Part 40 and Appendix A to 41 CFR Part 101-19, subpart 101-19.6); the Americans with Disabilities Act (42 U.S.C. 12131; 47 U.S.C. 155, 201, 218, and 225); Texas Administrative Code, Title 10, Chapter 60, Subchapter (B) the Texas Architectural Barriers Act (TABAA); the Architectural Barriers (AB) Rules; and the Texas Accessibility Standards (TAS).

BYRD ANTI-LOBBYING AGREEMENT (2 CFR 200 APPENDIX II (J) AND 24 CFR 570.303)

Pursuant to 31 U.S.C.A. § 1352 (2003), if at any time during the contract term funding to contract exceeds \$100,000.00, the Contractor shall file with the County the Federal Standard Form LLL titled "Disclosure Form to Report Lobbying."

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

ATTACHMENT B

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

CIVIL RIGHTS ACT OF 1964 (Title VI 42 U.S.C. § 2000d)

Title VI of the Civil Rights Act of 1964, Section 109 of the Community Development Act of 1974, Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. Section 794) (24 CFR Parts 8-9), and the Americans with Disabilities Act of 1990 (42 U.S.C. 12131; 47 U.S.C. 155, 201, 218, and 225), prohibits Contractors from excluding or denying individuals benefits or participation in this project on the basis of race, color, religion, national origin, sex, or disability. The provisions require that no person in the United States shall on the ground of race, color, religion, national origin, sex, or disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with community development funds made available pursuant to these Acts.

For purposes of this Part “program or activity” is defined as any function conducted by an identifiable administrative unit of the recipient, or private Contractor receiving community development funds or loans from the recipient. “Funded in whole or in part with community development funds” means that community development funds in any amount in the form of grants or proceeds from HUD guaranteed loans have been transferred by the recipient or a subrecipient to an identifiable administrative unit and disbursed in a program or activity. A Contractor may not, under any program or activity to which the regulations of this Part may apply directly or through contractual or other arrangements, on the grounds of race, color, national origin, or sex:

- a. Deny any facilities, services, financial aid or other benefits provided under the program or activity;
- b. Provide any facilities, services, financial aid or other benefits, which are different, or are provided in a different form from that provided to others under the program or activity;
- c. Subject to segregated or separate treatment in any facility in, or in any matter of process related to receipt of any service or benefit under the program or activity;
- d. Restrict in any way access to, or in the enjoyment of any advantage or privilege enjoyed by others in connection with facilities, services, financial aid or other benefits under the program or activity;
- e. Treat an individual differently from others in determining whether the individual satisfies any admission, enrollment, eligibility, membership, or other requirement or condition which the individual must meet in order to be provided any facilities, services or other benefit provided under the program or activity; and
- f. Deny an opportunity to participate in a program or activity as an employee.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

CLEAN AIR ACT (2 CFR Appendix II to Part 200 (G))

Pursuant to 2 CFR Appendix II to Part 200 (G), if at any time during the contract term funding to contract exceeds \$150,000, the Contractor must comply with all provisions of the Clean Air Act (42 U.S.C. 85) and Section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended. Contractors securing a contract in excess of \$150,000.00 shall not expend such funds by making use of subcontracting with facilities included on the Environmental Protection Agency List of Violating Facilities as per Section 306 of the Clean Air Act, Section 508 of The Clean Water Act, Executive Order 11738, and Environmental Protection Agency Regulations 40 CFR.

For any subcontractors under this contract receiving contracts in excess of \$150,000 Contractor is required to include a provision that requires compliance with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 85) and Section 308 Federal Water Pollution Control Act as amended (33

U.S.C. 1251-1387). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (2 CFR Appendix II to Part 200 (E))

Pursuant to 2 CFR 200 Appendix II (E), if at any time during the contract term funding to contract exceeds \$100,000, the Contractor must comply with the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence

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

ATTACHMENT B

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The (write in the name of the Federal agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.
- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

COPELAND “ANTI-KICKBACK” ACT (40 U.S.C. 3145)

Pursuant to 2 CFR Appendix II to Part 200 (D), Contractor must comply with the provisions of the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each vendor, contractor, subcontractor, or subrecipient shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. Contractor shall include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract. Galveston County shall report all suspected or reported violations to the Federal awarding agency.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

COST PLUS CONTRACTING PROHIBITED (2 CFR 200.323(D))

Cost-plus-a-percentage-of-cost (CPPC) contracts are prohibited by 2 CFR 200.323(d). The cost plus a percentage of cost and percentage of construction cost methods of contracting must never be used, including in subcontracts and third-party contracts. A cost-plus contract is one that is structured to pay the contractor or subcontractor their actual costs incurred, plus a fixed percent for profit or overhead.

A cost-plus-a-percentage-of-cost (CPPC) contract is a contract containing some element that obligates Galveston County or Contractor to pay a contractor or subcontractor an amount (in the form of either profit or cost), undetermined at the time the contract was made, to be incurred in the future, and based on a percentage of future costs. The inclusion of an overall contract ceiling price does not make these forms of contracts acceptable.

This type of contract is prohibited because there is no incentive for the contractor or subcontractor to keep its incurred costs low. Instead, there is a reverse incentive for the contractor or subcontractor to continue to incur additional costs in order to continue to drive the percentage of cost up. In other words, increased spending by the contractor will yield higher profits. This prohibition applies to all work, regardless of the circumstances, and applies to subcontracts of the contractor cases where the prime contract is a cost-reimbursement type contract or subject to price redetermination.

DAVIS BACON AND RELATED ACTS (2 CFR 200 APPENDIX II (D))

Pursuant to 2 CFR 200 Appendix II (D), for any contract in excess of \$2,000, Contractor must comply with the Davis Bacon and Related Acts, and the requirements shall be applicable to any labor or mechanic work completed in connection with this contract which fall under the Davis Bacon Act. Any Contractor awarded under this contract is required to comply with the Davis Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR part 5) and with the Copeland "Anti-Kickback" Act (18 U.S.C. 874; 40 U.S.C. 3145) as supplemented in Department of Labor regulations (29 CFR part 3). In accordance with the statute, Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week.

If Davis Bacon is applicable, Galveston County will provide a copy of the current Davis Bacon Wage Decision with the solicitation. The decision to award a contract or subcontract shall be conditioned upon the acceptance of the wage determination. Contractor shall submit certified payroll of contractor and all subcontractors on a weekly basis in the format required by the County. At County's request, Contractor shall make available and shall require its subcontractors to make available, copies of cancelled checks and check stubs for comparisons by the County or its agents.

ATTACHMENT B

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR Part 5.5(a)(1)(ii)) and the Davis Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following. The Statement of Compliance can be found on page 2 of the WH-347 form, and/or additional certifications of compliance may be required by Galveston County. Any Statement of Compliance is subject to the penalties provided by 18 U.S.C. § 1001, namely, a fine, possible imprisonment of not more than 5 years, or both. Accordingly, the party signing the statement should have knowledge of the facts represented as true.

Contractor must include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract. Galveston County shall report all suspected or reported violations to the Federal awarding agency, as applicable.

DEBARMENT / SUSPENSION AND VOLUNTARY EXCLUSION (2 CFR Appendix II to Part 200 (I))

Pursuant to 2 CFR Appendix II to Part 200 (I), a Contract meeting the definition in 2 C.F.R. § 180.220 must not be made to parties listed on the System for Award Management (SAM) Exclusion lists, in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

Pursuant to Executive Orders 12549 and 12689, a contract award shall not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235). SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549. A contract award must not be made to parties listed in the SAM Exclusions. SAM exclusions can be accessed at www.sam.gov.

ATTACHMENT B

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

Additionally, no contracts shall be awarded to any Contractor that has been debarred, suspended, or otherwise excluded from or ineligible for participation in any federal programs, including but not limited to the Department of Health and Human Work (DHHS), Office of Inspector General (OIG) - List of Excluded Individuals & Entities (LEIE); U.S. General Services Administration (GSA) – Excluded Parties List System (EPLS); All States (50) Health & Human Work Commission Medicaid OIG Sanction List; Government Terrorist Watch List (OFAC / Patriot Act); Department of Commerce, Bureau of Industry and Security, Denied Persons List; and Department of Homeland Security, Immigration and Customs Enforcement (ICE) Most Wanted.

This contract is a covered transaction for purposes of compliance with Title 2 C.F.R. parts 180 and 3000, and as such the Contractor is required to verify that none of the contractor, its principals (as defined at 2 C.F.R. § 180.995), or its affiliates (as defined at 2 C.F.R. § 180.905) are excluded (as defined at 2 C.F.R. § 180.940) or disqualified (as defined at 2 C.F.R. § 180.935). These regulations restrict awards, subawards, and contracts with certain parties that are debarred, suspended, or otherwise excluded from or ineligible for participation in Federal assistance programs and activities (See 2 C.F.R Part 200, Appendix II). The Contractor must comply with 2 C.F.R. part 180, subpart C and 2 C.F.R. part 3000, subpart C and shall include this requirement and similar certification in all contracts between itself and any subcontractors in connection with the services performed under this Contract.

The Contractor confirms that it is eligible or otherwise not disqualified or prohibited from participation in federal or state assistance programs under Executive Order 12549, Debarment and Suspension. Additionally, the Contractor warrants that it is not debarred, suspended, or otherwise excluded from or ineligible for participation in any federal programs, including but not limited to the following: Department of Health and Human Work (DHHS), Office of Inspector General (OIG) - List of Excluded Individuals & Entities (LEIE); U.S. General Services Administration (GSA) – Excluded Parties List System (EPLS); All States (50) Health & Human Work Commission Medicaid OIG Sanction List; Government Terrorist Watch List (OFAC / Patriot Act); Department of Commerce, Bureau of Industry and Security, Denied Persons List; and Department of Homeland Security, Immigration and Customs Enforcement (ICE) Most Wanted. Galveston County reserves the right to verify any contractor's status and document instances of debarment, suspension, or other ineligibility.

Contractor shall verify that all subcontractors performing work under this Contract are not debarred, disqualified, or otherwise prohibited from participation in accordance with the requirements above. The Contractor further must notify Galveston County in writing immediately if Contractor or its subcontractors are not in compliance with Executive Order 12549 during the term of this contract. Contractor shall include this provision in all contracts between itself and any subcontractors in connection with the services performed under this Contract.

If it is found that the Contractor did not comply or is not in compliance with Executive Order 12549 (2 C.F.R. part 180, subpart C and 2 C.F.R. part 3000, subpart C), the Contractor may be subject to available remedies,

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

including but not limited to, refunding Galveston County for any payments made to the Contractor while ineligible, and also acknowledges that the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

EQUAL EMPLOYMENT OPPORTUNITY (41 CFR 60-1.4(b) and 2 CFR 200 APPENDIX II (C))

Contractor must comply with, and incorporate or cause to be incorporated into any contract for construction work, or modification thereof, the Equal Employment Opportunity provisions as follows:

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3. The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

5. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
6. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
7. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
8. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The Contractor further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The Contractor agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and

ATTACHMENT B

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The Contractor further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the Contractor agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the Contractor under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such Contractor; and refer the case to the Department of Justice for appropriate legal proceedings.

Contractor must include the equal opportunity clause in each of its nonexempt subcontracts, and to require all non-exempt subcontractors to include the equal opportunity clause in each of its nonexempt subcontracts.

EQUAL EMPLOYMENT OPPORTUNITY FOR WORKERS WITH DISABILITIES (48 CFR 52.22236)

During the performance of this contract, the Contractor must comply with required Equal Employment Opportunity for Workers with Disabilities provisions.

Contractor shall include the following equal opportunity clause in each of its covered Government contracts or subcontracts (and modifications, renewals, or extensions thereof if not included in the original contract):

- a. Equal opportunity clause. The Contractor shall abide by the requirements of the equal opportunity clause at 41 CFR 60-741.5(a), as of March 24, 2014. This clause prohibits discrimination against qualified individuals on the basis of disability and requires affirmative action by the Contractor to employ and advance in employment qualified individuals with disabilities.
- b. Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of \$15,000 unless exempted by rules, regulations, or orders of the Secretary, so that such provisions will be binding upon each subcontractor or vendor. The Contractor shall act as specified by the Director, Office of Federal Contract Compliance Programs of the U.S. Department of Labor, to enforce the terms, including action for noncompliance. Such necessary changes in language may be made as shall be appropriate to identify properly the parties and their undertakings.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

EQUAL EMPLOYMENT OPPORTUNITY FOR VEVRAA PROTECTED VETERANS (41 CFR 60.300)

Galveston County is an equal opportunity employer of protected veterans. During the performance of this contract, the Contractor must comply with required Equal Employment Opportunity for VEVRAA Protected Veterans provisions.

Contractor shall include the following equal opportunity clause in each of its covered Government contracts or subcontracts (and modifications, renewals, or extensions thereof if not included in the original contract):

- a. The definitions set forth in 41 CFR 60-300.2 apply to the terms used throughout this Clause, and they are incorporated herein by reference.
- b. The contractor shall not discriminate against any employee or applicant for employment because he or she is a disabled veteran, recently separated veteran, active-duty wartime or campaign badge veteran, or Armed Forces service medal veteran (hereinafter collectively referred to as “protected veteran(s)”) in regard to any position for which the employee or applicant for employment is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals without discrimination based on their status as a protected veteran in all employment practices, including the following:
 - i. Recruitment, advertising, and job application procedures.
 - ii. Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring.
 - iii. Rates of pay or any other form of compensation and changes in compensation.
 - iv. Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists.
 - v. Leaves of absence, sick leave, or any other leave.
 - vi. Fringe benefits available by virtue of employment, whether or not administered by the contractor.
 - vii. Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training.
 - viii. Activities sponsored by the contractor including social or recreational programs.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

- ix. Any other term, condition, or privilege of employment.

- c. The contractor shall immediately list all employment openings which exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract and including those occurring at an establishment of the contractor other than the one where the contract is being performed, but excluding those of independently operated corporate affiliates, with the appropriate employment service delivery system where the opening occurs. Listing employment openings with the state workforce agency job bank or with the local employment service delivery system where the opening occurs will satisfy the requirement to list jobs with the appropriate employment service delivery system. In order to satisfy the listing requirement described herein, contractors must provide information about the job vacancy in any manner and format permitted by the appropriate employment service delivery system which will allow that system to provide priority referral of veterans protected by VEVRAA for that job vacancy. Providing information on employment openings to a privately run job service or exchange will satisfy the contractor's listing obligation if the privately run job service or exchange provides the information to the appropriate employment service delivery system in any manner and format that the employment service delivery system permits which will allow that system to provide priority referral of protected veterans.

- d. Listing of employment openings with the appropriate employment service delivery system pursuant to this clause shall be made at least concurrently with the use of any other recruitment source or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and nonveterans. The listing of employment openings does not require the hiring of any particular job applicants or from any particular group of job applicants, and nothing herein is intended to relieve the contractor from any requirements in Executive orders or regulations regarding nondiscrimination in employment.

- e. Whenever a contractor, other than a state or local governmental contractor, becomes contractually bound to the listing provisions in paragraphs 2 and 3 of this clause, it shall advise the employment service delivery system in each state where it has establishments that: (a) It is a Federal contractor, so that the employment service delivery systems are able to identify them as such; and (b) it desires priority referrals from the state of protected veterans for job openings at all locations within the state. The contractor shall also provide to the employment service delivery system the name and location of each hiring location within the state and the contact information for the contractor official responsible for hiring at each location. The "contractor official" may be a chief hiring official, a Human Resources contact, a senior management contact, or any other manager for the contractor that can verify the information set forth in the job listing and receive priority referrals from employment service delivery systems. In the event that the contractor uses any external job search organizations to assist in its hiring,

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

the contractor shall also provide to the employment service delivery system the contact information for the job search organization(s). The disclosures required by this paragraph shall be made simultaneously with the contractor's first job listing at each employment service delivery system location after the effective date of this final rule. Should any of the information in the disclosures change since it was last reported to the employment service delivery system location, the contractor shall provide updated information simultaneously with its next job listing. As long as the contractor is contractually bound to these provisions and has so advised the employment service delivery system, there is no need to advise the employment service delivery system of subsequent contracts. The contractor may advise the employment service delivery system when it is no longer bound by this contract clause.

- f. The provisions of paragraphs 2 and 3 of this clause do not apply to the listing of employment openings which occur and are filled outside of the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, Guam, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, Wake Island, and the Trust Territories of the Pacific Islands.
- g. As used in this clause:
 - i. All employment openings include all positions except executive and senior management, those positions that will be filled from within the contractor's organization, and positions lasting three days or less. This term includes full-time employment, temporary employment of more than three days' duration, and part-time employment.
 - ii. Executive and senior management means: (1) Any employee (a) compensated on a salary basis at a rate of not less than \$455 per week (or \$380 per week, if employed in American Samoa by employers other than the Federal Government), exclusive of board, lodging or other facilities; (b) whose primary duty is management of the enterprise in which the employee is employed or of a customarily recognized department or subdivision thereof; (c) who customarily and regularly directs the work of two or more other employees; and (d) who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring, firing, advancement, promotion or any other change of status of other employees are given particular weight; or (2) any employee who owns at least a bona fide 20-percent equity interest in the enterprise in which the employee is employed, regardless of whether the business is a corporate or other type of organization, and who is actively engaged in its management.
 - iii. Positions that will be filled from within the contractor's organization means employment openings for which no consideration will be given to persons outside the contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings which the contractor proposes to fill from regularly established "recall" lists. The

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

exception does not apply to a particular opening once an employer decides to consider applicants outside of his or her own organization.

- h. The contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- i. In the event of the contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.
- j. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, Office of Federal Contract Compliance Programs, provided by or through the contracting officer. Such notices shall state the rights of applicants and employees as well as the contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are protected veterans. The contractor must ensure that applicants or employees who are disabled veterans are provided the notice in a form that is accessible and understandable to the disabled veteran (e.g., providing Braille or large print versions of the notice, posting the notice for visual accessibility to persons in wheelchairs, providing the notice electronically or on computer disc, or other versions). With respect to employees who do not work at a physical location of the contractor, a contractor will satisfy its posting obligations by posting such notices in an electronic format, provided that the contractor provides computers that can access the electronic posting to such employees, or the contractor has actual knowledge that such employees otherwise are able to access the electronically posted notices. Electronic notices for employees must be posted in a conspicuous location and format on the company's intranet or sent by electronic mail to employees. An electronic posting must be used by the contractor to notify job applicants of their rights if the contractor utilizes an electronic application process. Such electronic applicant notice must be conspicuously stored with, or as part of, the electronic application.
- k. The contractor will notify each labor organization or representative of workers with which it has a collective bargaining agreement or other contract understanding that the contractor is bound by the terms of VEVRAA and is committed to take affirmative action to employ and advance in employment, and shall not discriminate against, protected veterans.
- l. The contractor will include the provisions of this clause in every subcontract or purchase order of \$100,000 or more, unless exempted by the rules, regulations, or orders of the Secretary issued pursuant to VEVRAA so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Director, Office of Federal Contract Compliance Programs, may direct to enforce such provisions, including action for noncompliance.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

- m. The contractor must, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to their protected veteran status.
- n. The Contractor shall forfeit as a penalty to the County who administers the subject Project receiving Federal assistance, Sixty Dollars (\$60.00) for each worker, employed for each calendar day, or a portion thereof, such worker is paid less than the said stipulated rates for any work done under this Project, by him/her or by any contractor under him/her.
- o. All contractors shall keep, or cause to be kept, an accurate record showing the names of all workers, also the actual per diem wages paid to each of such workers.

FAIR LABOR STANDARDS ACT

Contractor must comply the Fair Labor Standards Act of 1938 (29 U.S.C. Section 201 et seq.) as now or hereafter amended, which regulates wage, hour and other employment practices that govern the use of funds provided and the employment of personnel under this contract. The Contractor warrants that it will pay all its workers all monies earned by its workers including, but not limited to regular wages, any overtime compensation, or any additional payments pursuant to the Fair Labor Standards Act, 29 United States Code (U.S.C.) Section 207 9a(1), as amended; the Texas Pay Day Act; the Equal Pay Act; Title VII of the Civil Rights Act of 1964, 42 U.S.C. Section 2000, et al., as amended; or any provisions of the Texas Labor Code Ann., as amended.

FLOOD DISASTER PROTECTION ACT OF 1973 (24 CFR 570.605)

Contractor must comply with the provisions in 24 CFR 570.605, Section 202(a) of the Flood Disaster Protection Act of 1973 (42 U.S.C. 4106), and the regulations in 44 CFR Parts 59-79.

GREEN BUILDING STANDARDS

At a minimum, Contractors and subcontractors must comply with local codes and any applicable national building codes for any work involving rehabilitation or construction, including design. When a contract is funded, in whole or in part, by HUD funding, Contractors must comply with applicable Green Building standards to the maximum extent feasible. Green Building standards may apply to single-family properties, multifamily properties, or both and may include, but are not limited to best practices defined under LEED, Enterprise Green Communities, or NAHB National Green Building Standards and may include specific measures for water conservation, energy efficiency, and indoor air quality. Contractor and subcontractors must comply with the following standards, as applicable:

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

- 2009 ICC International Energy Conservation Code (IECC)
- ASHRAE 90.1-2007, which sets minimum energy standards for buildings except low-rise residential buildings
- ASHRAE 62.1-2010 and 62.2-2010, which set minimum standards for ventilation for indoor air quality for common areas in mid- and high-rise buildings, and low-rise residential buildings, respectively.
- New or replacement residential housing, when funded by CDBG-DR grants, must adhere to Green Building standards, including Energy Star Certified Homes or Energy Star for Multifamily High Rise and other applicable green building requirements.
- Moderate residential housing rehabilitation, when funded by CDBG-DR grants, must comply with the Community Planning & Development (CPD) Retrofit Checklist and provide Energy Star appliances, Water Sense or FEMP products if replaced.
- New or replacement residential housing, when funded by CDBG-DR grants, must adhere to Green Building standards, including Energy Star Certified Homes or Energy Star for Multifamily High Rise and other applicable green building requirements.

HOLD HARMLESS AGREEMENT

Contractor shall indemnify, defend, and hold harmless Galveston County from all claims for personal injury, death and/or property damage resulting directly or indirectly from contractor's performance. Contractor shall procure and maintain, with respect to the subject matter of this Invitation for Bids, appropriate insurance coverage including, at a minimum, public liability and property damage with adequate limits to cover contractor's liability as may arise directly or indirectly from work performed under terms of this Invitation for Bids. Certification of such coverage must be provided to the County upon request.

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

LEAD-BASED PAINT (24 CFR 570.608)

Contractor and subcontractors must comply with the provisions found in 24 CFR 570.608, the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846), the Residential Lead Based Paint Hazard Reduction Act of 1992 (U.S.C. 4851-4856, and 24 CFR Part 35, subparts A, B, J, K, and R. This Article 2(f) is to be included in all subcontracts, for work in connection with this Contract, which relate to residential structures.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

NON-COLLUSION (The Sherman Act)

Contractor must comply with the requirements of The Sherman Act, which prohibit collusion. Collusion occurs when two persons or representatives of an entity or organization make an agreement to deceive or mislead another. Such agreements are usually secretive and involve fraud or gaining an unfair advantage over a third party, competitors, consumers or others with whom they are negotiating. The collusion, therefore, makes the bargaining process inherently unfair. Collusion can involve promises of future benefits, price or wage fixing, kickbacks, or misrepresenting the independence of the relationship between the colluding parties.

The Sherman Act prohibits any agreement among competitors to fix prices, rig bids, or engage in other anticompetitive activity. Collusion, bid rigging, or other anticompetitive activity is considered a felony.

Contractor shall not in any way, directly or indirectly:

- a. Collude, conspire, or agree with any other person, firm, corporation, Bidder or potential Bidder to the amount of this Bid or the terms or conditions of this Bid.
- b. Pay or agree to pay any other person, firm, corporation Bidder or potential Bidder any money or anything of value in return for assistance in procuring or attempting to procure a contract or in return for establishing the prices in the attached Bid or the Bid of any other Bidder.
- c. Assemble in coordination with any other organization in an attempt to fix the price of the work.

Contractors are expected to report any suspected fraud, collusion, or impropriety from the inception of solicitation through the end of the contract term.

NON-SEGREGATED FACILITIES

“Prohibition of Segregated Facilities”

- a. Segregated facilities means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

Sexual orientation has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

- b. The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.
- c. The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

PARTICIPATION BY MINORITY & WOMEN-OWNED BUSINESS ENTERPRISES (2 CFR 200.321)

Contractor must comply with the Minority and Women-owned Business Enterprise participation requirements under 2 CFR 200.321. Contractors must take all affirmative steps necessary to subcontract with Minority and Women-owned Business Enterprises (MWBEs) to assure that MWBEs are used when possible. These affirmative steps shall include:

- A. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- B. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
- C. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
- D. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and
- E. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

The State of Texas maintains a Historically Underutilized Business Program, which identifies any business at least 51 percent owned by an Asian Pacific American, Black American, Hispanic American, Native American, American woman and/or Service-Disabled Veteran, who resides in Texas and actively participate in the control, operations and management of the entity's affairs as a Historically Underutilized Business (also considered MWBE). Contractors who wish to check the status of a firm may visit <https://comptroller.texas.gov/purchasing/vendor/hub/>.

Contractors and subcontractors are required to facilitate Minority & Women-Owned Business Enterprise participation. Contractors are encouraged to utilize MWBEs / HUB firms as subcontractors, subconsultants, or

ATTACHMENT B

INVITATION TO BID
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

suppliers in order to comply with the requirements and may check for firms who perform relevant work by searching <https://comptroller.texas.gov/purchasing/vendor/hub/>.

Contractor and subcontractors must facilitate Minority & Women-Owned Business Enterprise participation and take all affirmative steps to utilize M/WBEs / HUB firms as subcontractors, subconsultants, or suppliers throughout the life of the Contract.

POTENTIAL CONFLICTS OF INTEREST

Pursuant to 2 CFR 200.112, Contractor must comply with disclosure requirements in accordance with Texas Local Government Code, Chapter 176. Contractor shall not use funds to directly or indirectly pay any person for influencing or attempting to influence any public employee or official in connection with the awarding of any contract or the extension, continuation, renewal, amendment or modification of any contract. By law, the Conflict of Interest Questionnaire (provided by the Texas Ethics Commission at www.ethics.state.tx.us) must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the Contractor becomes aware of facts that require the statement to be filed.

This law requires persons desiring to do business with the County to disclose any gifts valued in excess of \$250 given to any County Official or the County Official's family member, or employment of any County Official or the County Official's family member during the preceding twelve (12) month period. The disclosure questionnaire must be filed with the Galveston County Clerk. Refer to Texas Local Government Code, Chapter 176 for the details of this law.

An outside consultant or contractor is prohibited from submitting a bid for services on a Galveston County project of which the consultant or contractor was a designer or other previous contributor, or was an affiliate, subsidiary, joint venture or was in any other manner associated by ownership to any party that was a designer or other previous contributor. If such a consultant or contractor submits a prohibited bid, that bid shall be disqualified on the basis of conflict of interest, no matter when the conflict is discovered by Galveston County.

PREVAILING WAGES (2 CFR 200 APPENDIX II (D) and TGC 2258)

Pursuant to 2 CFR 200 Appendix II (D), Contractor must comply with Texas Government Code (TGC) 2258, Prevailing Wage Rates. Accordingly, Contractor must submit a certified payroll records as required, and compensate any worker employed on a public works project not less than as applicable. As noted under "Davis Bacon and Related Acts", when required by Federal program legislation, construction contracts in excess of \$2,000 awarded by Galveston County shall require compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, Contractor must pay wages to laborers and mechanics at a rate not less than the local prevailing wages, or Davis Bacon wages, as applicable. If both Texas prevailing wages and Davis Bacon provide rates for

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

a particular class, Contractors must pay the greater wage rate. In addition, Contractor must pay wages not less than once a week.

In compliance with Section 2258 of the Texas Government Code, Contractor and any subcontractor hired by Contractor for the construction of any project, shall pay not less than the rates set forth in the Schedule of Prevailing Wages attached and incorporated by reference. In submitting a Bid, Contractor warrants that it and its subcontractors shall comply with all requirements and worker ratios per the applicable Schedule of Prevailing Wages and Texas state law.

Contractor must submit certified payroll of contractor and all subcontractors on a weekly basis. At County's request, Contractor must make available and shall require its subcontractors to make available, copies of cancelled checks and check stubs for comparisons by the County or its agents. Regardless of whether Davis Bacon or Texas Prevailing Wages apply, the County reserves the right for its agents to visit the project site and to interview contractor, its subcontractors and employees of each on any date or time, as often as desired during the construction period, without prior notification.

Galveston County will ascertain if proper wage rates are being paid to the employees as required. In the event of a discrepancy between the work performed and the wages paid, the County shall document same and notify Contractor. If, for any length of time and as determined by Galveston County, discrepancies appear between the certified payrolls and the actual wage paid, the County shall require check stubs to be attached to each weekly certified payroll.

Pursuant to Texas Government Code Section 2258.051, the County reserves the right to withhold any monies due Contractor until such discrepancy is resolved and the necessary adjustment made. The Contractor shall forfeit as a penalty, in accordance with Texas Government Code Section 2258.023(b), to the County or entity who administers the subject Project receiving Federal assistance, Sixty Dollars (\$60.00) for each worker, employed for each calendar day, or a portion thereof, such worker is paid less than the said stipulated rates for any work done under this Project, by him/her or by any contractor/subcontractor under him/her.

All contractor/subcontractor shall keep, or cause to be kept, an accurate record showing the names of all workers, also the actual per diem wages paid to each of such workers. Contractor shall impose these same obligations upon its Subcontractors. Contractor understands that with weekly or monthly certified payrolls, contractor is responsible for any and all penalties that shall accrue during the month, regardless of the fact that any error could not be discovered by the Contract Compliance Officer until the following certified payroll.

PROCUREMENT OF RECOVERED MATERIALS (2 CFR 200.322)

Pursuant to 2 CFR 200.322, Contractor must comply with Section 6002 of the Solid Waste Disposal Act, Pub. L. No. 89-272 (1965) (codified as amended by the Resource Conservation and Recovery Act at 42 U.S.C. § 6962). As such, any contractors awarded under this contract opportunity is subject to the requirements of

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

Section 6002, which include procuring only items designated in guidelines of the EPA at 40 C.F.R. Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired by the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS

Contractor must comply with 31 U.S.C. Chapter 38, Administrative Remedies for False Claims and Statements, which shall apply to the activities and actions of the Contractor and its subcontractors pertaining to any matter resulting from the contract.

RESTRICTIONS ON PUBLIC BUILDINGS AND PUBLIC WORKS PROJECTS CERTIFICATION

- b. Definitions. The definitions pertaining to this provision are those that are set forth on the clause entitled "Restrictions on Public Works Projects." (Set out under "Contract Clauses" below.)
- c. Certification. Except as provided in paragraph (C) of this provision, by submission of its bid or proposal, Bidder certifies that it:
 - i. Is not a Contractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR) (see paragraph (H) of this provision);
 - ii. Has not or will not enter into any subcontract with a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR, and
 - iii. Will not provide any product of a country included on the list of foreign countries that discriminate against the U.S. firms published by the USTR.
- d. Inability to certify. A Bidder unable to certify in accordance with paragraph (b) of this provision shall submit with its offer a written explanation fully describing the reasons for its inability to make the certification.
- e. Applicability of 18 U.S.C. 1001. This certification is paragraph (B) of this provision concerns a matter within the jurisdiction of an agency of the United States, and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18 U.S.C. 1001.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

- f. Notice. Bidder shall provide written notice to the Contracting Officer if, at any time before the contract award, Bidder learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- g. Restrictions on contract award. Unless a waiver to these restrictions is granted by the Secretary of Housing and Urban Development, no contract will be awarded to a Bidder (1) who is owned or controlled by a citizen or national of a foreign country included on the list of foreign countries that discriminate against U.S. firms published by the USTR, (2) whose subcontractors are owned or controlled by citizens or national of a foreign country on the USTR list or, (3) who incorporates any product of a foreign country on the USTR list in the public works project.
- h. USTR List. The USTR published an initial list in the Federal Register on December 30, 1987 (53 FR 49244), which identified one country-Japan. The USTR can add countries to the list, and remove countries from it, in accordance with section 109 (C) of PUB. L. 100-202.

RESTRICTIONS ON PUBLIC BUILDINGS AND PUBLIC WORKS PROJECTS

- a. Definitions. "Component", as used in this clause, means those articles, materials, and supplies incorporated directly into the product. "Contractor or subcontractor of a foreign country," as used in this clause, means any Contractor or subcontractor that is a citizen or national of a foreign country or is controlled directly or indirectly by citizens or nationals of a foreign country. A contractor or subcontractor shall be considered to be a citizen or national of a foreign country, or controlled directly or indirectly by citizens or nationals of a foreign country:
 - i. If 50 percent or more of the Contractor or subcontractor is owned by a citizen or a national of the foreign country;
 - ii. If the title to 50 percent or more of the stock of the Contractor or subcontractor is held subject to trust or fiduciary obligation in favor of citizens or nationals of the foreign country.
 - iii. If 50 percent or more of the voting power in the Contractor or subcontractor is vested in or exercisable on behalf of a citizen or national of the foreign country; iv. In the case of a partnership, if any general partner is a citizen of the foreign country;
 - v. In the case of a corporation. If its presidents or other chief executive officer or the chairman of its board of directors is a citizen of the foreign country or the majority of any number of

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

its directors necessary to constitute a quorum are citizens of the foreign country or the corporation is organized under the laws of the foreign country or any subdivision, territory, or possession thereof; or

- vi. In case of a contractor or subcontractor who is a joint venture, if any participant firm is a citizen or national of a foreign country or meets any of the criteria in subparagraphs (A) 1 through 5 of this clause. "Product", as used in this clause, means construction materials, i.e. articles, materials and supplies brought to the construction site for incorporation into the public works project, including permanently affixed equipment, instruments, utilities, electronic or other devices, but not including vehicles or construction equipment. In determining the origin of a product, Galveston County will consider a product as produce in a foreign country if it has been assembled or manufactured in the foreign country, or if the cost of the components mined, produced, or manufactured in the foreign country exceed 50 percent of the cost of all its components.
- b. Restrictions. The Contractor shall not (1) knowingly enter into any subcontract under this contract with a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the United States Trade Representative (see paragraph (C) of this clause, or (2) supply any product under this contract of a country included on the list of foreign countries that discriminate against U.S. firms published by the USTR.
- c. USTR List. The USTR published an initial list in the Federal Register on December 30, 1987 (53 FR 49244), which identified one country-Japan. The USTR can add other countries to the list, or remove countries from it, in accordance with section 109 (C) of PUB. L. 100-102.
- d. Certification. The Contractor may rely upon the certification of a prospective subcontractor that it is not a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR and that products supplied by such subcontractor for use on the Federal public works project under this contract are not products of a foreign country included on the list of foreign countries that discriminate against U.S. firms published by the USTR, unless such Contractor has knowledge that the certification is erroneous.
- e. Subcontractors. The Contractor shall incorporate this clause, modified only for the purpose of properly identifying the parties, in all subcontracts. This paragraph (E) shall also be incorporated in all subcontracts.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

RIGHTS TO INVENTIONS (2 CFR Appendix II to Part 200 (F))

Any discovery or invention that arises during the course of the contract shall be reported to Galveston County. This clause requires the Contractor to disclose promptly inventions to the County (within 2 months) after the inventor discloses it in writing to Contractor personnel responsible for patent matters. The awarding agency shall determine how rights in the invention/discovery shall be allocated consistent with "Government Patent Policy" and Title 37 C.F.R. § 401.

If the Federal award meets the definition of "funding agreement" under 37 C.F.R. §.401.2(a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with the requirements of Title 37 C.F.R. § 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

SECTION 109 OF THE HOUSING AND COMMUNITY DEVELOPMENT ACT OF 1974 (24 CFR 570.602)

Section 109 of the Act requires that no person in the United States shall on the grounds of race, color, national origin, religion, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance made available pursuant to the Act. Section 109 also directs that the prohibitions against discrimination on the basis of age under the Age Discrimination Act and the prohibitions against discrimination on the basis of disability under Section 504 shall apply to programs or activities receiving Federal financial assistance under Title I programs. The policies and procedures necessary to ensure enforcement of section 109 are codified in 24 CFR part 6.

SECTION 3 ACT OF 1968 (12 U.S.C. 1701u and 24 CFR Part 135)

DISCLAIMER: THIS CONTRACT IS NOT HUD-FUNDED AND THEREFORE SECTION 3 DOES NOT APPLY TO THIS CONTRACT.

For any HUD-funded contract with a value in excess of \$100,000, Contractor and subcontractors must comply with the Section 3 Act of 1968. The purpose of Section 3 is to ensure that employment and other economic opportunities generated by certain HUD financial assistance shall, to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, be directed to low- and very low-income persons, particularly those who are recipients of government assistance for housing, and to business concerns which provide economic opportunities to low- and very low-income persons. Section 3 is triggered when the normal completion of construction and rehabilitation projects creates the need for new employment, contracting, or training opportunities.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

For any Section 3 Covered Contracts, Contractor and subcontractors must comply with all provisions of the Section 3 Act of 1968, contained under 24 CFR 135. Contractor and subcontractors must include the Section 3 Clause in its entirety, in every subcontract subject to compliance with regulations in 24 CFR 135.

Contractor and subcontractors must assure that to the greatest extent feasible, contracts for work to be performed in connection with the project are awarded to Section 3 Business Concerns. Contractor and subcontractors must post all new hire opportunities with the local Workforce Solutions Center and/or Work-in-Texas, in accordance with 24 CFR 135. The minimum numeric goals for Section 3 utilization are:

- 30 percent of total number of new hires are Section 3 Residents (i.e. 1 out of 3 new hires); 10 percent of all awarded construction contracts are awarded to Section 3 Business Concerns;
- 3 percent of all awarded non-construction contracts are awarded to Section 3 Business Concerns.

§ 135.38 Section 3 clause.

All section 3 covered [contracts](#) shall include the following clause (referred to as the section 3 clause):

A. The work to be performed under this [contract](#) is subject to the requirements of section 3 of the [Housing and Urban Development Act of 1968](#), as amended, [12 U.S.C. 1701u](#) (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are [recipients](#) of HUD assistance for housing.

B. The parties to this [contract](#) agree to comply with HUD's regulations in [24 CFR part 135](#), which implement section 3. As evidenced by their execution of this [contract](#), the parties to this [contract](#) certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The [contractor](#) agrees to send to each labor organization or representative of workers with which the [contractor](#) has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the [contractor's](#) commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and [applicants](#) for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The [contractor](#) agrees to include this section 3 clause in every subcontract subject to compliance with regulations in [24 CFR part 135](#), and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the [subcontractor](#) is in violation of the regulations in [24 CFR part 135](#). The [contractor](#) will not subcontract with any [subcontractor](#) where

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

the [contractor](#) has notice or knowledge that the [subcontractor](#) has been found in violation of the regulations in [24 CFR part 135](#).

E. The [contractor](#) will certify that any vacant employment positions, including training positions, that are filled (1) after the [contractor](#) is selected but before the [contract](#) is executed, and (2) with persons other than those to whom the regulations of [24 CFR part 135](#) require employment opportunities to be directed, were not filled to circumvent the [contractor](#)'s obligations under [24 CFR part 135](#).

F. Noncompliance with HUD's regulations in [24 CFR part 135](#) may result in sanctions, termination of this [contract](#) for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the [Indian Self-Determination and Education Assistance Act \(25 U.S.C. 450e\)](#) also applies to the work to be performed under this [contract](#). Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of [contracts](#) and sub [contracts](#) shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this [contract](#) that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

TERMINATION FOR CAUSE & CONVENIENCE (2 CFR Appendix II to Part 200 (A) and (B))

Pursuant to 2 CFR Appendix II to Part 200 (A), Contracts for more than the simplified acquisition threshold currently set at \$150,000, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, shall address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.

Pursuant to 2 CFR Appendix II to Part 200 (B), all contracts in excess of \$10,000 shall address termination for cause and for convenience by the non-Federal entity including the manner by which it will be affected and the basis for settlement. Galveston County shall have the right to terminate this contract for cause and convenience.

In the event of a failure by Contractor to satisfactorily perform the services specified herein and/or a default by Contractor in abiding by the other terms and conditions of this Contract, Galveston County may terminate the Contract on written notice to Contractor and Contractor shall be liable for all damages, costs, and expenses (including attorney fees) incurred by County related to this default. Such termination is in addition to and not in lieu of any other remedies that Galveston County may have in law or equity. Administrative remedies for nonperformance, violation or breach of contract terms, or termination of contract for default may include suspension and debarment. Galveston County may assess liquidated damages for failure to meet completion deadlines, contract breaches, or performance failures of the Contractor or its Subcontractors.

ATTACHMENT B

INVITATION TO BID DANIEL DROR AVENUE GALVESTON COUNTY, TEXAS

Contractor shall be provided the opportunity to cure certain performance failures or instances of default as described in the contract documents. The legal dispute resolution process as applicable under the Texas Civil Practice and Remedies Code shall include, but is not limited to, Texas and Civil Practice and Remedies Section 38 – Attorney’s Fees, Texas Civil Practice and Remedies Section 41 – Damages, and Texas Civil Practice and Remedies Section 154 – General Provisions. Galveston County and Contractor(s) should attempt to resolve any claim for breach of contract made by Contractor, to the extent it is applicable to the Contract and not preempted by other law. Except as otherwise provided by law, nothing herein is a waiver by the County or the State of Texas of the right to seek redress in a court of law.

Termination provisions are included in the Contract Requirements & Payment, Section VIII, portion of this IFB.

WHISTLEBLOWER PROTECTION ACT

Contractor, subcontractors, and employees working on this Project shall be subject 41 U.S. Code § 4712, which requires that an employee of a contractor, subcontractor, grantee, or subgrantee or personal services contractor may not be discharged, demoted, or otherwise discriminated against as a reprisal for disclosing information that the employee reasonably believes is evidence of gross mismanagement of a Federal contract or grant, a gross waste of Federal funds, an abuse of authority relating to a Federal contract or grant, a substantial and specific danger to public health or safety, or a violation of law, rule, or regulation related to a Federal contract (including the competition for or negotiation of a contract) or grant.

The Contractor shall inform its employees and subcontractors in writing, in the predominant language of the workforce, of employee whistleblower rights and protections under 41 U.S.C. 4712, as described in section 3.908 of the Federal Acquisition Regulation. The Contractor shall insert the substance of this clause, including this paragraph, in all subcontracts providing services for this Project.



Prohibition on Contracts with Companies Boycotting Israel

Prohibition on contracts with companies boycotting Israel per Government Code 2271.001 Definitions:

- (1) **"Boycott Israel"** has the meaning assigned by Section 808.001.
- (2) **"Company"** has the meaning assigned by Section 808.001; except that the term does not include a sole proprietorship.
- (2) **"Governmental entity"** has the meaning assigned by Government Code, Section 2251.001.

PROVISION REQUIRED IN CONTRACT. (a) This section applies only to a contract that:

- (1) is between a governmental entity and a company with 10 or more full-time employees; and
- (2) has a value of \$100,000 or more that is to be paid wholly or partly from public funds of the governmental entity.

(b) A governmental entity may not enter into a contract with a company for goods or services unless the contract contains a written verification from the company that it:

- (1) does not boycott Israel; and
- (2) will not boycott Israel during the term of the contract.

As required by GOVERNMENT CODE, CHAPTER 2271, CONTRACTOR hereby verifies that it does not boycott Israel and will not boycott Israel throughout the term of this Agreement. For the purposes of this verification, "Boycott Israel" means refusing to deal with, terminating business activities, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

Individual by oath swears that the following statements are factual and true:

1. Individual is authorized by the Contractor to make this statement for the Contractor.
2. Individual has read and is fully aware of the facts stated in this statement.
3. Individual can read and comprehend the English language.
4. In accordance with Texas Government Code Section 2271.002, this company does not boycott Israel and will not boycott Israel during the term of this contract/agreement.

Date: _____

Business Name of Contractor: _____

Company Address: _____

County of Contractor: _____

Name of Individual: _____

Signature of Individual: _____



Prohibition on Contracts with Certain Companies

Prohibition on contracts with certain companies per Government Code 2252.151 Definitions:

- (1)“Company” has the meaning assigned by Section 806.001.
- (2)“Foreign terrorist organization” means an organization designated as a foreign terrorist organization by the United States secretary of state as authorized by 8 U.S.C. Section 1189.
- (3)“Governmental contract” means a contract awarded by a governmental entity for general construction, an improvement, a service, or a public works project for a purchase of supplies, materials, or equipment. The term includes a contract to obtain a professional or consulting service subject to Government Code, Chapter 2254.
- (4)“Governmental entity” has the meaning assigned by Government Code, Section 2252.001.

Section 2252.152 – CONTRACTS WITH COMPANIES ENGAGED IN BUSINESS WITH IRAN, SUDAN, OR FOREIGN TERRORIST ORGANIZATION PROHIBITED. A governmental entity may not enter into a governmental contract with a company that is identified on a list prepared and maintained under Section 806.051, 807.051, or 2252.153.

Section 2252.153 – Listed Companies. The comptroller shall prepare and maintain, and make available to each governmental entity, a list of companies known to have contracts with or provide supplies o services to a foreign terrorist organization.

Pursuant to Chapter 2252, Texas Government Code, VENDOR represents and certifies that, at the time of execution of this Agreement, neither Vendor, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same (i) engages in business with Iran, Sudan, or any foreign terrorist organization as described in Chapters 806 or 807 of the Texas Government Code, or Subchapter F of Chapter 2252 of the Texas Government Code, or (ii) is a company listed by the Texas Comptroller of Public Accounts under Sections 806.051, 807.051, or 2252.153 of the Texas Government Code. The term “foreign terrorist organization” in this paragraph has the meaning assigned to such term in Section 2252.151 of the Texas Government Code.

Individual by oath swears that the following statements are factual and true:

1. Individual is authorized by the Contractor to make this statement for the Contractor.
2. Individual has read and is fully aware of the facts stated in this statement.
3. Individual can read and comprehend the English language.
4. As required by GOVERNMENT CODE, CHAPTER 2252.152, CONTRACTOR hereby verifies that it is not identified on a list prepared and maintained under Section 806.051, 807.051, or 2252.153, or contracting with a company doing business with Iran, Sudan, or any foreign terrorist organizations.

Date: _____

Business Name of Contractor: _____

Company Address: _____

County of Contractor: _____

Name of Individual: _____

Signature of Individual: _____

CERTIFICATION REGARDING LOBBYING
(31 U.S.C.A. § 1352)
This Certification must be completed, signed, dated and
returned to the Galveston County Purchasing Agent

Procurement Number and Description: _____

ITB #B211031, Daniel Dror Avenue

Proposer **CERTIFIES**, to the best of its knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the proposer, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the proposer shall complete and submit **Standard Form LLL**, "Disclosure Form to Report Lobbying", in accordance with its instructions.
3. Proposer shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Name of Organization/Corporation: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Signature of Authorized Signatory for Proposer: _____ Date Signed: _____

Title of Authorized Signatory of Proposer: _____

State of Texas

§

§

County of Galveston

§

NON-COLLUSION AFFIDAVIT

Before me, the undersigned notary, on this day personally appeared _____ (Affiant), whom being first duly sworn, deposes and certifies that:

- Affiant is the _____ of _____, that
(Individual, Partner, Corporate Officer) (Name of Qualifier)
submitted the attached Qualification in **ITB #B211031, Daniel Dror Avenue**
- Affiant is a duly authorized representative of Qualifier and is authorized to make this Non-Collusion Affidavit;
- The attached Qualification is genuine and is not a collusive or sham Qualification;
- The attached Qualification has been independently arrived at without collusion with any other qualifier, bidder, proposer, person, firm, competitor, or potential competitor;
- Qualifier has not colluded, conspired, connived or agreed, directly or indirectly, with any other qualifier, bidder, proposer, person, firm, competitor, or potential competitor, to submit a collusive or sham qualification or that such other qualifier, bidder, proposer, person, firm, competitor, or potential competitor shall refrain from qualifying;
- Qualifier has not in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other qualifier, bidder, proposer, person, firm, competitor, or potential competitor to fix the price or prices in the attached Qualification or of the qualification any other qualifier;
- Qualifier has not in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other qualifier bidder, proposer, person, firm, competitor, or potential competitor to fix the overhead, profit or cost element of the Qualification price or prices of any other qualifier, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against Galveston County or any person interested in the proposed contract;
- Affiant has not in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other qualifier, bidder, proposer, person, firm, competitor, or potential competitor, paid or agreed to pay any other qualifier, bidder, proposer, person, firm, competitor, or potential competitor any money or anything of value in return for assistance in procuring or attempting to procure a contract or in return for establishing the price or prices in the attached Qualification or the qualification of any other Qualifier; and
- Affiant certifies that Affiant is fully informed regarding the accuracy of the statements contained herein, and under penalties of perjury, certifies and affirms the truth of the statements herein, such penalties being applicable to the Qualifier as well as to Affiant signing on its behalf.

Signature of Affiant

SWORN TO and **SUBSCRIBED** before me this _____ day of _____, 20__.

Notary Public

My Commission Expires: _____

**BID FORM
DANIEL DROR AVENUE
COUNTY OF GALVESTON, TEXAS**

By signing here, the firm does hereby attest that it has fully read the instructions, conditions and general and special provisions and understands them.

THE COMPANY OF: _____

ADDRESS: _____

FEIN (TAX ID): _____

The following shall be returned with your bid. Failure to do so may be ample cause for rejection of bid as non-responsive. It is the responsibility of the Bidder to ensure that bidder has received all addenda.

Items:	Confirmed (X):
1. References (if required)	_____
2. Addenda, if any	#1 _____ #2 _____ #3 _____ #4 _____
3. One (1) original and two (2) copies of submittal	_____
4. Bid Form	_____
5. Vendor Qualification Packet	_____
6. Debarment Certification Form	_____
7. Non-Collusion Affidavit	_____
8. Payment Terms:	_____ net 30 _____ Other
9. Lobbyist Certification	_____
10. Bid Bond	_____
11. Boycotting Israel Form	_____
12. Contracts with Other Companies Form	_____

Person to contact regarding this bid: _____

Title: _____ Phone: _____ Fax: _____

E-mail address: _____

Name of person authorized to bind the Firm: _____

Signature: _____ Date: _____

Title: _____ Phone: _____ Fax: _____

E-mail address: _____

**BID FORM
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS**

Bidder shall use this form to provide the information for notice.

1. Contact information for notice:

Name: _____
Address: _____

Telephone Number: _____ Facsimile number: _____

2. If a copy of notice is requested, please complete below:

Name: _____
Address: _____

Telephone Number: _____ Facsimile number: _____

3. If second or more copies are requested for notice, please supplement this form and clearly mark the supplement as "Supplementary Notice Information."

Bidder to submit reference information. Bidder shall use this form to provide minimum required reference information. If Bidder wishes to provide more than the minimum, Bidder should supplement this form and should clearly mark the supplement as "Supplementary Reference Information."

1. References who can attest to the Bidder's capability to carry out the requirements set forth in this bid:

Business Name of Organization: _____
Name of Person: _____
Title of Individual within Organization, if applicable _____
Business address: _____

Telephone number: _____ Facsimile number: _____

Business Name of Organization: _____
Name of Person: _____
Title of Individual within Organization, if applicable _____
Business address: _____

Telephone number: _____ Facsimile number: _____

Business Name of Organization: _____
Name of Person: _____
Title of Individual within Organization, if applicable _____
Business address: _____

Telephone number: _____ Facsimile number: _____

BID FORM
DANIEL DROR AVENUE
GALVESTON COUNTY, TEXAS

References of major supplier of Bidder who can speak to the financial capability of the Bidder to carry out the requirements set forth in this bid:

1. Business Name of Supplier _____
Name of Person: _____
Title of Individual within business: _____
Business address: _____

Telephone number: _____ Facsimile number: _____

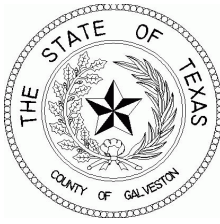
2. Business Name of Supplier _____
Name of Person: _____
Title of Individual within business: _____
Business address: _____

Telephone number: _____ Facsimile number: _____

3. Business Name of Supplier _____
Name of Person: _____
Title of Individual within business: _____
Business address: _____

Telephone number: _____ Facsimile number: _____

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County of Galveston
ACKNOWLEDGMENT AND CERTIFICATION REGARDING DEBARMENT,
SUSPENSION, AND OTHER INELIGIBILITY
Executive Orders 12549 & 12689 Certification, Debarment and Suspension

Solicitation Number: ITB #B211031

Solicitation Title: DANIEL DROR AVENUE

Contractor hereby CERTIFIES that:

Contractor, and all of its principals, is not presently debarred, suspended, proposed for debarment, proposed for suspension, or declared ineligible under Executive Order 12549 or Executive Order 12689, Debarment and Suspension, and is not in any other way ineligible for participation in Federal or State assistance programs;

Contractor, and all of its principals, were not and have not been debarred, suspended, proposed for debarment, proposed for suspension, or declared ineligible under Executive Order 12549 or Executive Order 12689, Debarment and Suspension, and were not and have not been in any other way ineligible for participation in Federal or State assistance programs at the time its' proposal was submitted in the procurement identified herein and at any time since submission of its' proposal;

Contractor has included, and shall continue to include, this certification in all contracts between itself and any sub-contractors in connection with services performed under this contract; **and**

Contractor shall notify Galveston County in writing immediately, through written notification to the Galveston County Purchasing Agent, if Contractor is not in compliance with Executive Order 12549 or 12689 during the term of its contract with Galveston County.

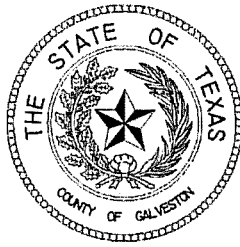
Contractor **Represents** and **Warrants** that the individual executing this Acknowledgment and Certification on its behalf has the full power and authority to do so and can legally bind the Contractor hereto.

Name of Business

Date

By: _____
Signature

Printed Name & Title



County of Galveston Purchasing Department Vendor Qualification Packet

(rev. 1.4, September 28, 2017)

All interested parties seeking consideration for qualified vendor status with the County of Galveston should complete and return only the following forms to:

Galveston County Purchasing Department
722 Moody Avenue, (21st Street), 5th Floor
Galveston, Texas 77550
(409) 770-5371 office
(409) 621-7987 fax

- PEID Form:** Person /Entity Information Data
- W -9 Form:** Request for Taxpayer Identification Number and Certification
(please note that the included form may not be the latest revised form issued by the Internal Revenue Service. Please check the IRS website at <http://www.irs.gov/pub/irs-rd/ffw9.pdf> for the latest revision of this form.)
- CIQ Form:** Conflict of Interest Questionnaire
(please note that the included form may not be the latest revised form issued by the State of Texas Ethics Commission. Please check the Texas Ethics Commission website at http://www.ethics.state.tx.us/whatsnew/conflict_forms.htm for the latest revision of this form. Please note that Galveston County Purchasing Agent is not responsible for the filing of this form with the Galveston County Clerk per instructions of the State of Texas Ethics Commission).
- Debarment:** **CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS & REQUIREMENT TO REGISTER IN SAM**
*Vendors/contractor certifies that neither it, nor any of its Principals, are presently debarred, suspended, proposed for debarment, disqualified, excluded, or in any way declared ineligible for the award of contracts by any Federal agency. Vendor agrees that it shall refund Galveston County for any payments made to Contractor while ineligible. Vendor acknowledges that Contractor's uncured failure to perform under any agreement with the County of Galveston, if such should occur, may result in Contractor being debarred from performing additional work for the County, the respecting State Agency administering the grant funding the contract, if applicable, the State, FEMA or HUD (as applicable), and other Federal and State entities. Further, Vendor has executed the Certification Regarding Debarment, Suspension, Proposed Debarment, and Other Responsibility Matters and returned the fully completed and executed original certification with the submission of this Vendor Qualification Packet. **The truthful and fully completed and executed original of the Certification Regarding Debarment, Suspension, Proposed Debarment, and Other Responsibility Matters must be included with the submission of this Vendor Qualification Packet and is a mandatory requirement to become a vendor of Galveston County. Vendor's failure to include the fully completed and executed original of this Certification shall be considered non-compliant with the requirements of this vendor qualification request and grounds for the rejection of vendor's request. Vendor shall immediately notify the County Purchasing Agent if it becomes debarred or suspended, placed on***

the Consolidated List of Debarred Contractors, or in any other way becomes ineligible for award of contract by any Federal agency. This Certification is a material fact relied upon by Galveston County; if it is later determined that the vendor did not comply with 2 C.F.R. Part 180 and 2 C.F.R. Part 3000, in addition to the remedies available to Galveston County and the State agency administering a grant, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment of contractor. If the contract to be awarded pursuant to a Galveston County procurement effort involves the use of Federal funds, then vendor must also be registered in the Federal Contractor Registry through the System for Award Management (SAM) to be eligible for award of contract pursuant to the procurement.

Information regarding the SAM is available at:

<http://www.federalcontractorregistry.com/?gclid=CIG1hf2rr8wCFYkCaQoducANZw> or at <https://www.sam.gov/portal/SAM/#1>.

No contract involving the use of Federal funds may be awarded to any vendor unless and until such registration is current and in good standing under SAM. Successful vendors must maintain SAM registration throughout the entire term of any contractual agreement with the County. If a contract involves the use of Federal funds, then vendor must enclose proof of such SAM registration within its response, which is also a mandatory requirement of County procurement policy; failure to enclose such proof shall be considered non-compliant with the requirements of any procurement effort and grounds for the rejection of vendor's response to any procurement efforts (i.e., bid, proposal, or qualifications statement, as applicable).

Certificate(s) of Insurance: If the person or entity seeking qualified vendor status with the County will be performing work at or on any County owned facility and/or property, Certificate(s) of Insurance are required to be submitted prior to performing any work.

Insurance requirements are as follows:

Public Liability and Property Damage Insurance:

Successful vendor agrees to keep in full force and effect, a policy of public liability and property damage insurance issued by a casualty company authorized to do business in the State of Texas, and in standard form approved by the Board of Insurance Commissioners of the State of Texas, with coverage provisions insuring the public from any loss or damage that may arise to any person or property by reason of services rendered by vendor. Vendor shall at its own expense be required to carry the following minimum insurance coverages:

1. For damages arising out of bodily injury to or death of one person in anyone occurrence - one hundred thousand and no/100 dollars (\$100,000.00);
2. For damages arising out of bodily injury to or death of two or more persons in anyone occurrence - three hundred thousand and no/100 dollars (\$300,000.00); and
3. For injury to or destruction of property in anyone occurrence - one hundred thousand and no/100 dollars (\$100,000.00).

This insurance shall be either on an occurrence basis or on a claims made basis. Provided however, that if the coverage is on a claims made basis, then the vendor shall be required to purchase, at the termination of this agreement, tail coverage for the County for the period of the County's relationship with the vendor under this agreement. Such coverage shall be in the amounts set forth in subparagraphs (1), (2), and (3) above.

Worker's Compensation Insurance:

Successful vendor shall also carry in full force Workers' Compensation Insurance policy(ies), if there is more than one employee, for all employees, including but not limited to full time, part time, and emergency employees employed by the vendor. Current insurance certificates certifying that such policies as specified above are in full force and effect shall be furnished by the vendor to the County.

The County of Galveston shall be named as additional insured on policies listed in subparagraphs above and shall be notified of any changes to the policy(ies) during the contractual period.

Insurance is to be placed with insurers having a Best rating of no less than A. The vendor shall furnish the County with certificates of insurance and original endorsements affecting coverage required by these insurance clauses. The certificates and endorsements for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf. The vendor shall be required to submit annual renewals for the term of any contractual agreement, purchase order or term contract, with Galveston County prior to expiration of any policy.

In addition to the remedies stated herein, the County has the right to pursue other remedies permitted by law or in equity.

The County agrees to provide vendor with reasonable and timely notice of any claim, demand, or cause of action made or brought against the County arising out of or related to utilization of the property. Vendor shall have the right to defend any such claim, demand, or cause of action at its sole cost and expense and within its sole and exclusive discretion. The County agrees not to compromise or settle any claim or cause of action arising out of or related to the utilization of the property without the prior written consent of the vendor.

In no event shall the County be liable for any damage to or destruction of any property belonging to the vendor unless specified in writing and agreed upon by both parties.

Procurement Policy - Special Note:

Understand that it is, according to Texas Local Government Code, Section 262.011, Purchasing Agents, subsections (d), (e), and (f), the sole responsibility of the Purchasing Agent to supervise all procurement transactions.

Therefore, be advised that all procurement transactions require proper authorization in the form of a Galveston County purchase order from the Purchasing Agent's office prior to commitment to deliver supplies, materials, equipment, including contracts for repair, service, and maintenance agreements. Any commitments made without proper authorization from the Purchasing Agent's office, pending Commissioners' Court approval, may become the sole responsibility of the individual making the commitment including the obligation of payment.

Code of Ethics - Statement of Purchasing Policy:

Public employment is a public trust. It is the policy of Galveston County to promote and balance the objective of protecting the County's integrity and the objective of facilitating the recruitment and retention of personnel needed by Galveston County. Such policy is implemented by prescribing essential standards of ethical conduct without creating unnecessary obstacles to entering public office.

Public employees must discharge their duties impartially so as to assure fair competitive access to governmental procurement by responsible contractors. Moreover, they should conduct themselves in such a manner as to foster public confidence in the integrity of the Galveston County procurement organization.

To achieve the purpose of these instructions, it is essential that those doing business with Galveston County also observe the ethical standards prescribed here.

General Ethical Standards: It shall be a breach of ethics to attempt to realize personal gain through public employment with Galveston County by any conduct inconsistent with the proper discharge of the employee's duties.

It shall be a breach of ethics to attempt to influence any public employee of Galveston County to breach the standards of ethical conduct set forth in this code.

It shall be a breach of ethics for any employee of Galveston County to participate directly or indirectly in procurement when the employee knows that:

- The employee or any member of the employee's immediate family has a financial interest pertaining to the procurement.
- A business or organization in which the employee, or any member of the employee's immediate family, has a financial interest pertaining to the procurement.
- Any other person, business or organization with which the employee or any member of the employee's immediate family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

Gratuities: It shall be a breach of ethics to offer, give or agree to give any employee of Galveston County, or for any employee or former employee of Galveston County to solicit, demand, accept or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation of any part of a program requirement or purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any program requirement or a contract or subcontract, or to any solicitation or proposal therefore pending before this government.

Kickbacks: It shall be a breach of ethics for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor for any contract for Galveston County, or any person associated therewith, as an inducement for the award of a subcontract or order.

Contract Clause: The prohibition against gratuities and kickbacks prescribed above shall be conspicuously set forth in every contract and solicitation by Galveston County.

Confidential Information: It shall be a breach of ethics for any employee or former employee of Galveston County to knowingly use confidential information for actual or anticipated personal gain, or for the actual or anticipated gain of any person.

Questions/Concerns:

If you have any questions or concerns regarding the information or instructions contained within this packet, please contact any member of the Purchasing Department staff at (409) 770-5371.

CONFLICT OF INTEREST DISCLOSURE REPORTING

Proposer may be required under Chapter 176 of the Texas Local Government Code to complete and file a conflict of interest questionnaire (CIQ Form). If so, the completed CIQ Form must be filed with the County Clerk of Galveston County, Texas.

If Proposer has an employment or other business relationship with an officer of Galveston County or with a family member of an officer of Galveston County that results in the officer or family member of the officer receiving taxable income that exceeds \$2,500.00 during the preceding 12-month period, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

If Proposer has given an officer of Galveston County or a family member of an officer of Galveston County one or more gifts with an aggregate value of more than \$250.00 during the preceding 12-months, then Proposer **MUST** complete a CIQ Form and file the original of the CIQ Form with the County Clerk of Galveston County.

The Galveston County Clerk has offices at the following locations:

Galveston County Clerk
Galveston County Justice Center, Suite 2001
600 59th Street
Galveston, Texas 77551

Galveston County Clerk
North County Annex, 1st Floor
174 Calder Road
League City, Texas 77573

Again, if Proposer is required to file a CIQ Form, the original completed form is filed with the Galveston County Clerk (not the Purchasing Agent).

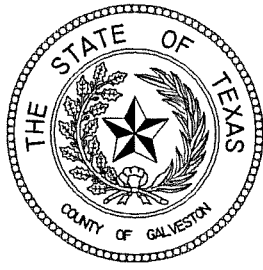
For Proposer's convenience, a blank CIQ Form is enclosed with this proposal. Blank CIQ Forms may also be obtained by visiting the Galveston County Clerk's website and/or the Purchasing Agent's website - both of these web sites are linked to the Galveston County homepage, at <http://www.co.galveston.tx.us>.

As well, blank CIQ Forms may be obtained by visiting the Texas Ethics Commission website, specifically at <http://www.ethics.state.tx.us/whatsnew/conflictforms.htm>.

Chapter 176 specifies deadlines for the filing of CIQ Forms (both initial filings and updated filings).

It is Proposer's sole responsibility to file a true and complete CIQ Form with the Galveston County Clerk if Proposer is required to file by the requirements of Chapter 176. Proposer is advised that it is an offense to fail to comply with the disclosure reporting requirements dictated under Chapter 176 of the Texas Local Government Code.

If you have questions about compliance with Chapter 176, please consult your own legal counsel. Compliance is the individual responsibility of each person, business, and agent who is subject to Chapter 176 of the Texas Local Government Code.



COUNTY of GALVESTON
Purchasing Department

rev. 1.3, March 29, 2010

FORM PEID:	Request for Person-Entity Identification Data
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Instructions: Please type or print clearly when completing sections 1 thru 4 and return completed form to:

Galveston County Purchasing Agent
722 Moody Avenue (21 st. Street), 5th Floor
Galveston, Texas 77550
(409) 770-5371
prodoc@co.galveston.tx.us

1.	Business Name:			
	Attention Line:			
2.	Physical Address:			
	City:		State:	Zip+4:
	Billing / Remit Address:			
3.	City:		State:	Zip+4
	Main Contact Person:			
4.	Main Phone Number:			
	Fax Number:			
	E-mail Address:			

Areas below are for County use only.

Requested By:	Phone / Ext. #
Department:	Date:

Action Requested - Check One:	IFAS PEID Vendor Number:	
<input type="checkbox"/> Add New	<input type="checkbox"/> Change Data	<input type="checkbox"/> Re-activate
<input type="checkbox"/> Inactivate	<input type="checkbox"/> Employee	<input type="checkbox"/> Attorney
<input type="checkbox"/> Landlord	<input type="checkbox"/> Foster Parent	<input type="checkbox"/> Refund
<input type="checkbox"/> OneTime	<input type="checkbox"/> Foster Child	

Request for Taxpayer Identification Number and Certification

**Give Form to the
 requester. Do not
 send to the IRS.**

Print or type See Specific Instructions on page 2.	1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.	
	2 Business name/disregarded entity name, if different from above	
	3 Check appropriate box for federal tax classification; check only one of the following seven boxes: <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <small>Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.</small> <input type="checkbox"/> Other (see instructions) ▶ _____	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____ <small>(Applies to accounts maintained outside the U.S.)</small>
	5 Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
	6 City, state, and ZIP code	
	7 List account number(s) here (optional)	

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number											
				-			-				
or											
Employer identification number											
				-							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here	Signature of U.S. person ▶ _____	Date ▶ _____
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General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at www.irs.gov/fw9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)

- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
 - Form 1099-C (canceled debt)
 - Form 1099-A (acquisition or abandonment of secured property)
- Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding? on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note. ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

Limited Liability Company (LLC). If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

- 1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)
- 2—The United States or any of its agencies or instrumentalities
- 3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities
- 5—A corporation
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission
- 8—A real estate investment trust
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940
- 10—A common trust fund operated by a bank under section 584(a)
- 11—A financial institution
- 12—A middleman known in the investment community as a nominee or custodian
- 13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over \$600 required to be reported and direct sales over \$5,000 ¹	Generally, exempt payees 1 through 5 ²
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

¹ See Form 1099-MISC, Miscellaneous Income, and its instructions.

² However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

- A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)
- B—The United States or any of its agencies or instrumentalities
- C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities
- D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)
- E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)
- F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state
- G—A real estate investment trust
- H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940
- I—A common trust fund as defined in section 584(a)
- J—A bank as defined in section 581
- K—A broker
- L—A trust exempt from tax under section 664 or described in section 4947(a)(1)
- M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note. You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at www.ssa.gov. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at www.irs.gov/businesses and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account ¹
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor ²
4. a. The usual revocable savings trust (grantor is also trustee) b. So-called trust account that is not a legal or valid trust under state law	The grantor-trustee ¹ The actual owner ¹
5. Sole proprietorship or disregarded entity owned by an individual	The owner ³
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor ⁴

For this type of account:	Give name and EIN of:
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity ⁴
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

¹ List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

² Circle the minor's name and furnish the minor's SSN.

³ You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

⁴ List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.

*Note. Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: spam@uce.gov or contact them at www.ftc.gov/idtheft or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001 (1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY

Date Received

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

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

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

3 Name of local government officer with whom filer has employment or business relationship.

Name of Officer

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

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

Yes

NO

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

Yes

NO

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an *officer* or director, or holds an ownership of 10 percent or more?

Yes

NO

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

4

Signature of person doing business with the governmental entity

Date

Adopted 06/29/2007

SPECIAL PROVISIONS FOR CONSTRUCTION

1. Contract and Contract Documents

The Plans, Specifications and Addenda, General Provisions shall form part of this contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth.

2. Definitions

Whenever used in any of the contract Documents, the following meanings shall be given to the terms here in defined:

- (a) The term "Contract" means the Contract executed between the County of Galveston, hereinafter called the Owner, and _____, hereinafter called Contractor, of which these GENERAL CONDITIONS, form a part.
- (b) The term "Project Area" means the area within which are the specified Contract limits of the Improvements contemplated to be constructed in whole or in part under this contract.
- (c) The term "Engineer" means HR Green, Inc., Engineer in charge, serving the Owner with architectural or engineering services, his successor, or any other person or persons, employed by the Owner for the purpose of directing or having in charge the work embraced in this Contract.
- (d) The term "Contract Documents" means and shall include the following: Invitation to Bid, , Signed Copy of Bid, General Conditions, Special Provisions For Construction, Acknowledgement and Certification Regarding Debarment, Non-Collusion Affidavit, Vendor Qualification Packet, Payment and Performance Bonds, Contract Award, Addenda (if any), Technical Specifications, and Drawings (as listed in the Schedule of Drawings).
- (e) The term "Substantially Complete" shall mean that the work is fully completed with the exception of minor miscellaneous work and adjustments.

3. Supervision By Contractor

- (a) Except where the Contractor is an individual and gives his personal supervision to the work, the Contractor shall provide a competent superintendent, satisfactory to the Local Public Agency and the Engineer, on the work at all times during working hours with full authority to act for him. The Contractor shall also provide an adequate staff for the proper coordination and expediting of his work.
- (b) The Contractor shall lay out his own work and he shall be responsible for all work executed by him under the Contract. He shall verify all figures and elevations before proceeding with the work and will be held responsible for any error resulting from his failure to do so.

4. Subcontracts

- (a) The Contractor shall not execute an agreement with any subcontractor or permit any subcontractor to perform any work included in this contract until he has verified the subcontractor as eligible to participate in federally funded contracts.
- (b) No proposed subcontractor shall be disapproved by the city/county except for cause.
- (c) The Contractor shall be as fully responsible to the city/county for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them.

- (d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work and required compliance by each subcontractor with the applicable provisions of the Contract.
- (e) Nothing contained in the Contract shall create any contractual relation between any subcontractor and the Owner.

5. Fitting and Coordination of Work

The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operations of all trades, subcontractors, or material suppliers engaged upon this Contract.

6. Payments to Contractor

(a) Partial Payments

- 1) The Contractor shall prepare his requisition for partial payment as of the last day of the month and submit it, with the required number of copies, to the Engineer for his approval. The amount of the payment due the Contractor shall be determined by adding to the total value of work completed to date, the value of materials properly stored on the site and deducting (1) Five percent (5%) of the total amount, to be retained until final payment and (2) the amount of all previous payments. The total value of work completed to date shall be based on the estimated quantities of work completed and on the unit prices contained in the agreement. The value of materials properly stored on the site shall be based upon the estimated quantities of such materials and the invoice prices. Copies of all invoices shall be available for inspection of the Engineer.
- 2) Monthly or partial payments made by the Owner to the Contractor are moneys advanced for the purpose of assisting the contractor to expedite the work of construction. The Contractor shall be responsible for the care and protection of all materials and work upon which payments have been made until final acceptance of such work and materials by the Owner. Such payments shall not constitute a waiver of the right of the Owner to require the fulfillment of all terms of the Contract and the delivery of all improvements embraced in this Contract complete and satisfactory to the Owner in all details.

(b) Final Payment

- 1) After final inspection and acceptance by the Owner of all work under the Contract, the Contractor shall prepare his requisition for final payment which shall be based upon the careful inspection of each item of work at the applicable unit prices stipulated in the Agreement. The total amount of the final payment due the Contractor under this contract shall be the amount computed as described above less all previous payments.
- 2) The Owner before paying the final estimate, shall require the Contractor to furnish releases or receipts from all subcontractors having performed any work and all persons having supplied materials, equipment (installed on the Project) and services to the Contractor, if the Owner deems it necessary in order to protect its interest. The Owner may, if it deems such action advisable, make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments made shall in no way impair the obligations of any surety or sureties furnished under this Contract.
- 3) Any amount due the Owner under Liquidated Damages shall be deducted from the final payment due the contractor.

(c) Payments Subject to Submission of Certificates

Each payment to the Contractor by the Owner shall be made subject to submission by the Contractor of all

written certifications required of him and his subcontractors.

(d) **Withholding Payments**

The Owner may withhold from any payment due the Contractor whatever is deemed necessary to protect the Owner, and if so elects, may also withhold any amounts due from the Contractor to any subcontractors or material dealers, for work performed or material furnished by them. The foregoing provisions shall be construed solely for the benefit of the Owner and will not require the Owner to determine or adjust any claims or disputes between the Contractor and his subcontractors or material dealers, or to withhold any moneys for their protection unless the Owner elects to do so. The failure or refusal of the Owner to withhold any moneys from the Contractor shall in no way impair the obligations of any surety or sureties under any bond or bonds furnished under this Contract.

7. Changes in the Work

- (a) The Owner may make changes in the scope of work required to be performed by the Contractor under the Contract without relieving or releasing the Contractor from any of his obligations under the Contract or any guarantee given by him pursuant to the Contract provisions, and without affecting the validity of the guaranty bonds, and without relieving or releasing the surety or sureties of said bonds. All such work shall be executed under the terms of the original Contract unless it is expressly provided otherwise.
- (b) Except for the purpose of affording protection against any emergency endangering health, life, limb or property, the Contractor shall make no change in the materials used or in the specified manner of constructing and/or installing the improvements or supply additional labor, services or materials beyond that actually required for the execution of the Contract, unless in pursuance of a written order from the Owner authorizing the Contractor to proceed with the change. No claim for an adjustment of the Contract Price will be valid unless so ordered.
- (c) If applicable unit prices are contained in the Agreement, the Owner may order the Contractor to proceed with desired unit prices specified in the Contract; provided that in case of a unit price contract the net value of all changes does not increase the original total amount of the agreement by more than twenty-five percent (25%) or decrease the original the total amount by eighteen percent (18%).
- (d) Each change order shall include in its final form:
 - 1) A detailed description of the change in the work.
 - 2) The Contractor's proposal (if any) or a confirmed copy thereof.
 - 3) A definite statement as to the resulting change in the contract price and/or time.
 - 4) The statement that all work involved in the change shall be performed in accordance with contract requirements except as modified by the change order.
 - 5) The procedures as outlined in this Section for a unit price contract also apply in any lump sum contract.

8. Estimated Quantities

This Contract, including the specifications, plans and estimates, is intended to show clearly all the work to be done and material to be furnished hereunder. The estimated quantities of the various classes of work to be done and material to be furnished under this contract are approximate and are to be used as a basis for estimating the probable cost of the work and for comparing the proposals offered for the work. It is understood and agreed that the actual amount of work to be done and material to be furnished under this contract may differ somewhat

from these estimates, and that the basis for payment under this contract shall be the plan quantity or actual amount of such work done whichever is specified. It is further understood that the County does not guarantee any minimum amount of work under this Contract.

Contractor agrees that it will make no claim for damages, anticipated profits or otherwise on account of any differences which may be found between the quantities of work actually done, the material actually furnished under this Contract and the estimated quantities contemplated and contained in the proposals.

9. Claims for Extra Cost

- (a) If the Contractor claims that any instructions by Drawings or otherwise involve extra cost or extension of time, he shall, within ten days after the receipt of such instructions, and in any event before proceeding to execute the work, submit his protest thereto in writing to the Owner, stating clearly and in detail the basis of his objections. No such claim will be considered unless so made.
- (b) Claims for additional compensation for extra work, due to alleged errors in ground elevations, contour lines, or bench marks, will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material, or performing more work, than would be reasonably estimated from the Drawings and maps issued.
- (c) Any discrepancies which may be discovered between actual conditions and those represented by the Drawings and maps shall be reported at once to the Owner and work shall not proceed except at the Contractor's risk, until written instructions have been received by him from the Owner.
- (d) If, on the basis of the available evidence, the Owner determines that an adjustment of the Contract Price and/or time is justifiable, a change order shall be executed.

10. Time

The Contractor is advised that time for completion will consist of the number of calendar days set out in the Contract Award. The time for completion will begin to run on the day after the issuance of a notice to proceed by the County. The Contractor is required to start work no later than ten (10) working days after the issuance of the written notice to proceed. Failure to timely commence operations may be deemed by the County to be a default. The Contractor will complete the work at that site within the time period specified. If there is more than one site listed on the notice to proceed, work for all sites must be completed not later than is specified for each site.

11. Termination, Delays, and Liquidated Damages

- (a) Right of the Owner to Terminate Contract.

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

(b) Liquidated Damages for Delays.

Contractor agrees that time is of the essence of this contract and that for each day of a delay of a day beyond the number of working days or calendar days herein agreed upon the completion of the work herein specified and contracted for (after due allowance for such extension of time as is provided for under Extension of Time hereinabove) County may withhold permanently from Contractor's total compensation the sum of \$1,000.00 for each calendar day of delay, until the work is completed, as liquidated damages for such delay. The Contractor and his sureties shall be liable to the Owner for the amount thereof.

(c) Excusable Delays.

- 1) The right of the Contractor to proceed shall not be terminated nor shall the Contractor be charged with liquidated damages for any delays in the completion of the work due to:
 - a. Any acts of the Government, including controls or restrictions upon or requisitioning of materials, equipment, tools, or labor by reason of war, national defense, or any other national emergency;
 - b. Any acts of the Owner;
 - c. Causes not reasonably foreseeable by the parties to this Contract at the time of the execution of the Contract which are beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God or of the public enemy, acts of another Contractor in the performance of some other contract with the Owner, fires, floods, epidemics, quarantine, restrictions, strikes, freight embargoes, and weather of unusual severity such as hurricanes, tornadoes, cyclones and other extreme weather conditions.
- 2) Provided, however, that the Contractor promptly notifies the Owner within ten (10) days in writing of the cause of the delay. Upon receipt of such notification, the Owner shall ascertain the facts and the cause and extent of delay. If, upon the basis of the facts and the terms of this contract, the delay is properly excusable, the Owner shall extend the time for completing the work for a period of time commensurate with the period of excusable delay.

12. Assignment or Novation

The Contractor shall not assign or transfer, whether by an assignment or novation, any of its rights, duties, benefits, obligations, liabilities, or responsibilities under this Contract without the written consent of the Owner; provided, however, that assignments to banks or other financial institutions may be made without the consent of the Owner. No assignment or novation of this Contract shall be valid unless the assignment or novation expressly provides that the assignment of any of the Contractor's rights or benefits under the Contract is subject to a prior lien for labor performed, services rendered, and materials, tools, and equipment supplied for the performance of the work under this Contract in favor of all persons, firms, or corporations rendering such labor or services or supplying such materials, tools, or equipment.

13. Disputes

- (a) All disputes arising under this Contract or its interpretation except those disputes covered by FEDERAL LABOR STANDARDS PROVISIONS whether involving law or fact or both, or extra work, and all claims for alleged breach of contract shall, within ten (10) days of commencement of the dispute, be presented by the Contractor to the Owner for decision. Any claim not presented within the time limit specified in this paragraph shall be deemed to have been waived, except that if the claim is of a continuing character and notice of the claim is not given within ten (10) days of its commencement, the claim will be considered only for a period commencing ten (10) days prior to the receipt of the Owner.

- (b) The Contractor shall submit in detail his claim and his proof thereof.
- (c) If the Contractor does not agree with any decision of the Owner, he shall in no case allow the dispute to delay the work but shall notify the Owner promptly that he is proceeding with the work under protest.

14. Technical Specifications and Drawings

Anything mentioned in the Technical Specifications and not shown on the Drawings, or vice versa, shall be of like effect as if shown on or mentioned in both. In case of difference between Drawings and Technical Specifications, the Technical Specifications shall govern. In case of any discrepancy in Drawings, or Technical Specifications, the matter shall be immediately submitted to the Owner, without whose decision, said discrepancy shall not be adjusted by the Contractor, save only at his own risk and expense.

15. Shop Drawings

- (a) All required shop drawings, machinery details, layout drawings, etc. shall be submitted to the Engineer in copies for approval sufficiently in advance of requirements to afford ample time for checking, including time for correcting, resubmitting and rechecking if necessary. The Contractor may proceed, only at his own risk, with manufacture or installation of any equipment or work covered by said shop drawings, etc. until they are approved and no claim, by the Contractor, for extension of the contract time shall be granted by reason of his failure in this respect.
- (b) Any drawings submitted without the Contractor's stamp of approval will not be considered and will be returned to him for proper resubmission. If any drawings show variations from the requirements of the Contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment of contract price and/or time, otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with the Contract even though the drawings have been approved.
- (c) If a shop drawing is in accordance with the contract or involves only a minor adjustment in the interest of the owner not involving a change in contract price or time; the engineer may approve the drawing. The approval shall not relieve the Contractor from his responsibility for adherence to the contract or for any error in the drawing.

16. Requests for Supplementary Information

It shall be the responsibility of the Contractor to make timely requests of the Owner for any additional information not already in his possession which should be furnished by the Owner under the terms of this Contract, and which he will require in the planning and execution of the work. Such requests may be submitted from time to time as the need approaches, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay. Each request shall be in writing, and list the various items and the latest date by which each will be required by the Contractor. The first list shall be submitted within two weeks after Contract award and shall be as complete as possible at that time. The Contractor shall, if requested, furnish promptly any assistance and information the Engineer may require in responding to these requests of the Contractor. The Contractor shall be fully responsible for any delay in his work or to others arising from his failure to comply fully with the provision of this section.

17. Materials and Workmanship

- (a) Unless otherwise specifically provided for in the technical specifications, all workmanship, equipment, materials and articles incorporated in the work shall be new and the best grade of the respective kinds for the purpose. Where equipment, materials, articles or workmanship are referred to in the technical specifications as "equal to" any particular standard, the Engineer shall decide the question of equality.

- (b) The Contractor shall furnish to the Owner for approval the manufacturer's detailed specifications for all machinery, mechanical and other special equipment, which he contemplates installing together with full information as to type, performance characteristics, and all other pertinent information as required, and shall likewise submit for approval full information concerning all other materials or articles which he proposes to incorporate.
- (c) Machinery, mechanical and other equipment, materials or articles installed or used without such prior approval shall be at the risk of subsequent rejection.
- (d) Materials specified by reference to the number or symbol of a specific standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the Invitation for Bids, except as limited to type, class or grade, or modified in the technical specifications shall have full force and effect as though printed therein.
- (e) The Owner may require the Contractor to dismiss from the work such employee or employees as the Owner or the Engineer may deem incompetent, or careless, or insubordinate.

18. Samples, Certificates and Tests

- (a) The Contractor shall submit all material or equipment samples, certificates, affidavits, etc., as called for in the contract documents or required by the Engineer, promptly after award of the contract and acceptance of the Contractor's bond. No such material or equipment shall be manufactured or delivered to the site, except at the Contractor's own risk, until the required samples or certificates have been approved in writing by the Engineer. Any delay in the work caused by late or improper submission of samples or certificates for approval shall not be considered just cause for an extension of the contract time.
- (b) Each sample submitted by the Contractor shall carry a label giving the name of the Contractor, the project for which it is intended, and the name of the producer. The accompanying certificate or letter from the Contractor shall state that the sample complies with contract requirements, shall give the name and brand of the product, its place of origin, the name and address of the producer and all specifications or other detailed information which will assist the Engineer in making a prompt decision regarding the acceptability of the sample. It shall also include the statement that all materials or equipment furnished for use in the project will comply with the samples and/or certified statements.
- (c) Approval of any materials shall be general only and shall not constitute a waiver of the Owner's right to demand full compliance with Contract requirements. After actual deliveries, the Engineer will have such check tests made as he deems necessary in each instance and may reject materials and equipment and accessories for cause, even though such materials and articles have been given general approval. If materials, equipment or accessories which fail to meet check tests have been incorporated in the work, the Engineer will have the right to cause their removal and replacement by proper materials or to demand and secure such reparation by the Contractor as is equitable.
- (d) Except as otherwise specifically stated in the Contract, the costs of sampling and testing will be divided as follows:
 - 1) The Contractor shall furnish without extra cost, including packing and delivery charges, all samples required for testing purposes, except those samples taken on the project by the Engineer;
 - 2) The Contractor shall assume all costs of re-testing materials which fail to meet contract requirements;
 - 3) The Contractor shall assume all costs of testing materials offered in substitution for those found deficient;

- 4) The Owner will pay all other expenses.

19. Permits and Codes

- (a) The Contractor shall give all notices required by and comply with all applicable laws, ordinances, and codes of the Local Government. All construction work and/or utility installations shall comply with all applicable ordinances, and codes including all written waivers. Before installing any work, the Contractor shall examine the drawings and technical specifications for compliance with applicable ordinances and codes and shall immediately report any discrepancy to the Owner. Where the requirements of the drawings and technical specifications fail to comply with such applicable ordinances or codes, the Owner will adjust the Contract by Change Order to conform to such ordinances or codes (unless waivers in writing covering the difference have been granted by the governing body or department) and make appropriate adjustment in the Contract Price or stipulated unit prices.
- (b) Should the Contractor fail to observe the foregoing provisions and proceed with the construction and/or install any utility at variance with any applicable ordinance or code, including any written waivers (notwithstanding the fact that such installation is in compliance with the drawings and technical specifications), the Contractor shall remove such work without cost to the Owner.
- (c) The Contractor shall at his own expense, secure and pay for all permits for street pavement, sidewalks, shed, removal of abandoned water taps, sealing of house connection drains, pavement cuts, buildings, electrical, plumbing, water, gas and sewer permits required by the local regulatory body or any of its agencies.
- (d) The Contractor shall comply with applicable local laws and ordinances governing the disposal of surplus excavation, materials, debris and rubbish on or off the Project Area and commit no trespass on any public or private property in any operation due to or connected with the Improvements contained in this Contract.
- (e) The Contractor will be required to make arrangements for and pay the water, electrical power, or any other utilities required during construction.
- (f) During construction of this project, the Contractor shall use every means possible to control the amount of dust created by construction. Prior to the close of a day's work, the Contractor, if directed by the Owner, shall moisten the bank and surrounding area to prevent a dusty condition.

20. Care of Work

- (a) The Contractor shall be responsible for all damages to person or property that occur as a result of his fault or negligence in connection with the prosecution of the work and shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance.
- (b) The Contractor shall provide sufficient competent watchmen, both day and night, including Saturdays, Sundays, and holidays, from the time the work is commenced until final completion and acceptance.
- (c) In an emergency affecting the safety of life, limb or property, including adjoining property, the Contractor, without special instructions or authorization from the Owner is authorized to act at his discretion to prevent such threatened loss or injury, and he shall so act. He shall likewise act if instructed to do so by the Owner.
- (d) The Contractor shall avoid damage as a result of his operations to existing sidewalks, streets, curbs, pavements, utilities (except those which are to be replaced or removed), adjoining property, etc., and he shall at his own expense completely repair any damage thereto caused by his operations.
- (e) The Contractor shall shore up, brace, underpin, secure, and protect as maybe necessary, all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be in any

way affected by the excavations or other operations connected with the construction of the improvements included in this Contract. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owner or other party before the commencement of any work. The Contractor shall indemnify and save harmless the Owner from any damages on account of settlements or the loss of lateral support of adjoining property and from all loss or expense and all damages for which the Owner may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

21. Accident Prevention

- (a) No laborer or mechanic employed in the performance of this Contract shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety as determined under construction safety and health standards promulgated by the Secretary of Labor.
- (b) The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the work.
- (c) The Contractor shall maintain an accurate record of all cases of death, occupational disease, or injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the Contract. The Contractor shall promptly furnish the Owner with reports concerning these matters.
- (d) The Contractor shall indemnify and save harmless the Owner from any claims for damages resulting from property damage, personal injury and/or death suffered or alleged to have been suffered by any person as a result of any work conducted under this contract.
- (e) The Contractor shall provide trench safety for all excavations more than five feet deep prior to excavation. All OSHA Standards for trench safety must be adhered to by the Contractor.
- (f) The contractor shall at all times conduct his work in such a manner as to insure the least possible inconvenience to vehicular and pedestrian traffic. At the close of the work each day, all streets where possible in the opinion of the Owner, shall be opened to the public in order that persons living in the area may have access to their homes or businesses by the use of the streets. Barricades, warning signs, and necessary lighting shall be provided to the satisfaction of the Owner at the expense of the Contractor.

22. Sanitary Facilities

The Contractor shall furnish, install and maintain ample sanitary facilities for the workmen. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations.

23. Use of Premises

- (a) The Contractor shall confine his equipment, storage of materials, and construction operations to the contract limits as shown on the drawings and as prescribed by ordinances or permits, or as may be desired by the Owner, and shall not unreasonably encumber the site or public rights of way with his materials and construction equipment.
- (b) The Contractor shall comply with all reasonable instructions of the Owner and all existing state and local regulations regarding signs, advertising, traffic, fires, explosives, danger signals, and barricades.

24. Removal of Debris, Cleaning, Etc.

The Contractor shall, periodically or as directed during the progress of the work, remove and legally dispose of all surplus excavated material and debris, and keep the Project Area and public rights of way reasonably clear. Upon completion of the work, he shall remove all temporary construction facilities, debris and unused materials provided for work, and put the whole site of the work and public rights of way in a neat and clean condition.

25. Inspection

- (a) All materials and workmanship shall be subject to inspection, examination, or test by the Owner and Engineer at any and all times during manufacture or construction and at any and all places where such manufacture or construction occurs. The Owner shall have the right to reject defective material and workmanship or require its correction. Unacceptable workmanship shall be satisfactorily corrected. Rejected material shall be promptly segregated and removed from the Project Area and replaced with material of specified quality without charge. If the Contractor fails to proceed at once with the correction of rejected workmanship or defective material, the Owner may by contract or otherwise have the defects remedied or rejected materials removed from the Project Area and charge the cost of the same against any Monies which may be due the Contractor, without prejudice to any other rights or remedies of the Owner.
- (b) The Contractor shall furnish promptly all materials reasonably necessary for any tests which may be required. All tests by the Owner will be performed in such manner as not to delay the work unnecessarily and will be made in accordance with the provisions of the technical specifications.
- (c) The Contractor shall notify the Owner sufficiently in advance of back filling or concealing any facilities to permit proper inspection. If any facilities are concealed without approval or consent of the Owner, the Contractor shall uncover for inspection and recover such facilities at his own expense, when so requested by the Owner.
- (d) Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire work to make an examination of work already completed by uncovering the same, the Contractor shall on request promptly furnish all necessary facilities, labor, and material. If such work is found to be defective in any important or essential respect, due to fault of the Contractor or his subcontractors, the Contractor shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the actual cost of labor and material necessarily involved in the examination and replacement, shall be allowed the Contractor and he shall, in addition, if completion of the work of the entire Contract has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.
- (e) Inspection of materials and appurtenances to be incorporated in the improvements included in this Contract may be made at the place of production, manufacture or shipment, whenever the quantity justifies it, and such inspection and acceptance, unless otherwise stated in the technical specifications, shall be final, except as regards (1) latent defects, (2) departures from specific requirements of the Contract, (3) damage or loss in transit, or (4) fraud or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the inspection of materials as a whole or in part will be made at the Project Site.
- (f) Neither inspection, testing, approval nor acceptance of the work in whole or in part, by the Owner or its agents shall relieve the Contractor or his sureties of full responsibility for materials furnished or work performed not in strict accordance with the Contract.

26. Review by Owner

The Owner and its authorized representatives and agents shall 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, provided, however that all instructions and approval with respect to the work will be given to the Contractor only by the Owner through its authorized representatives or agents.

27. Final Inspection

When the Improvements included in this Contract are substantially completed, the Contractor shall notify the Owner in writing that the work will be ready for final inspection on a definite date which shall be stated in the notice. The Owner will make the arrangements necessary to have final inspection commenced on the date stated in the notice, or as soon thereafter as is practicable.

28. Deduction for Uncorrected Work

If the Owner deems it not expedient to require the Contractor to correct work not done in accordance with the Contract Documents, an equitable deduction from the Contract Price will be made by agreement between the Contractor and the Owner and subject to settlement, in case of dispute, as herein provided.

29. Warranty of Title

No material, supplies, or equipment to be installed or furnished under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease-purchase or other agreement by which an interest is retained by the seller or supplier. The Contractor shall warrant good title to all materials, supplies, and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed by him to the Owner free from any claims, liens, or charges. Neither the Contractor nor any person, firm, or corporation furnishing any material or labor for any work covered by this Contract shall have any right to a lien upon any improvement or appurtenance. Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this paragraph shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

30. Warranty of Workmanship and Materials

Neither the final certificate of payment nor any provision in the Contract nor partial or entire use of the improvements included in this Contract by the Owner or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of 12 months from the date of final acceptance of the work.

31. Job Offices

- (a) The Contractor and his subcontractors may maintain such office and storage facilities on the site as are necessary for the proper conduct of the work. These shall be located so as to cause no interference to any work to be performed on the site. The Owner shall be consulted with regard to locations.
- (b) Upon completion of the improvements, or as directed by the Owner, the Contractors shall remove all such temporary structures and facilities from the site, and leave the site of the work in the condition required by the contract.

32. Partial Use of Site Improvements

The Owner may give notice to the Contractor and place in use those sections of the improvements which have been completed, inspected and can be accepted as complying with the technical specifications and if in its opinion, each such section is reasonably safe, fit, and convenient for the use and accommodation for which it was intended, provided:

- (a) The use of such sections of the Improvements shall in no way impede the completion of the remainder of the work by the Contractor.
- (b) The Contractor shall not be responsible for any damages or maintenance costs due directly to the use of such sections.
- (c) The period of guarantee stipulated in the Section 29 hereof shall not begin to run until the date of the final acceptance of all work which the Contractor is required to construct under this Contract.

33. Contract Period

The work to be performed under this contract shall commence within the time stipulated by the Owner in the Notice to Proceed, and shall be fully completed within 150 calendar days thereafter.

34. Keeping Of Plans And Specifications Accessible

The Contractor shall keep one (1) copy of all Plans and Specifications constantly accessible at the work site and available for inspection at all times.

35. Utilities

Contractor shall be responsible for any charges which may be made by any city or utility companies for the work to be performed by Contractor.

36. Parking

Contractor shall be responsible for the expense of parking the Contractor's vehicle(s) in a legal manner and at no expense or inconvenience to the County.

37. Fire And Safety

Contractor is completely responsible for fire protection at the job site as well as the safety of its own employees as well as those entering onto the job site.

38. Contractor's Buildings

The building of structures for housing men, or the erection of tents or other forms of protection will be permitted only at such places as the County shall permit, and the sanitary conditions of the grounds in or about such structures shall at all times be maintained in the manner satisfactory to the County.

39. Worksite Security

Contractor shall maintain the security of the worksite.

Contractor shall provide a adequate protection to persons on the worksite, adjacent properties, and utilities as is necessary to keep each free of damage or injury. Contractor shall furnish all barricades, warning lights and other safety devices necessary for the safety and protection of the public and shall remove them upon completion of the work performed on those premises under the terms of this contract.

Contractor will have complete control over the work site and shall be fully responsible for any loss of or damage to any County property from any cause and will reimburse County in the event of any loss or damage to County's property from any cause.

Contractor shall take proper means to protect adjacent or adjoining properties which might be injured or seriously affected by construction undertaken under this Agreement from any damage or injury by reason of said process of construction. Contractor shall be liable for any and all claims for such damage on account of its failure to fully protect all adjoining properties.

40. Final Grading

If grading is required, when work is complete, Contractor shall grade the site to fill in holes and make a presentable appearance without disturbing trees and add fill dirt if needed. Contractor may not leave voids in the grading and compaction of the property. The land shall have a smooth appearance without concrete, bricks, building materials, and other debris on the surface.

41. Changes And Alterations

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

If such changes or alterations diminish the quantity of the work to be done, they shall not constitute the basis for a claim for damages, or anticipated profits on the work that may be dispensed with. If they increase the amount of the work, and the increased work can fairly be classified under the specifications, such increase shall be paid for according to the quantity actually done and at the unit price established for such work under this contract; otherwise such additional work shall be paid for as provided under the paragraph entitled "EXTRA WORK". In case the County shall make such changes or alterations as shall make useless any work already done or material already furnished or used in said work, then County shall recompense Contractor for any material or labor so used, and for any actual loss occasioned by such change due to actual expenses incurred in preparation for the work as originally planned.

42. Extra Work

The term "Extra Work" as used in this contract shall be understood to mean and include all work that may be required by the County to be done by Contractor to accomplish any change, alteration or addition to the work shown in the plans and specifications.

It is agreed that Contractor shall perform all Extra Work under the direction of the County when presented with a Written Work Order signed by the County. It is also agreed that the compensation to be paid Contractor for performing said Extra Work shall be determined by one or more of the following methods:

Method (a) - By agreed unit prices; or

Method (b) - By agreed lump sum; or

Method (c) - If Neither Method (a) nor Method (b) can be agreed upon before the Extra Work is commenced, then Contractor shall be paid the "Actual field cost" of the work plus fifteen (15) percent.

In the event said Extra Work be performed and paid for under Method (c), then the provisions of this paragraph shall apply and the "actual field cost" is hereby defined to include the cost of all workmen, such as foremen, timekeepers, merchants, and laborers, and materials, supplies, teams, trucks, rentals on machinery and equipment for time actually employed or used on such Extra Work plus actual transportation charges necessarily incurred, if the kind of equipment or machinery is not already on the job, together with all power, fuel, lubricants, water and similar operating expenses, also all necessary incidental expenses incurred directly

on account of such Extra Work including Social Security, Old Age Benefits and other payroll taxes, and a ratable proportion of premiums on Construction and Maintenance Bonds, Public Liability and Property Damage and Workmen's Compensation, and all other insurance as may be required by any law or ordinance. The County may direct the form in which accounts of the "actual field cost" shall be kept and may also specify in writing, before the work commences, the method of doing the work and the type and kind of machinery and equipment to be used, otherwise these matters shall be determined by Contractor. Unless otherwise agreed upon, the prices for the use of machinery and equipment shall be determined by using the one hundred (100) percent of the actual hourly or daily rate (for the time used plus time in moving to and from Job) of the latest schedule of Equipment Ownership Expense adopted by the Association General Contractors of America. Where practicable the terms and prices for the use of Machinery and Equipment shall be incorporated in the Written Extra Work Order. The fifteen (15) percent of the "Actual Field Cost" to be paid Contractor shall cover and compensate him for his profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the "actual field cost" as herein defined, save that where the Contractor's Camp or Field Office must be maintained primarily on account of such extra work, then the cost to maintain and operate same shall be included in the "actual field cost".

No claim for extra work of any kind will be allowed unless ordered in writing by the County. In case any orders or instructions, either oral or written appear to Contractor to involve extra work for which he should receive compensation, it shall make written request to the County for written order authorizing Extra Work. Should a difference of opinion arise as to what does or does not constitute extra work, or as to the payment therefor, and the County insists upon its performance, Contractor shall proceed with the work after making written order and shall keep an accurate account of the "actual field cost" thereof, as provided under Method (c) and by this action Contractor will thereby preserve the right to submit the matter of payment to litigation.

43. Salvage

Any materials, equipment and fixtures specifically ordered to be salvaged under these specifications shall remain the property of County and will be delivered to the site designated by the County. All other items shall be disposed of by Contractor in compliance with all applicable laws and regulations.

44. Compliance With Codes

Contractor shall comply with all city, county, and state codes, laws, and ordinances in force at the time of a ward of contract and applicable to such work. Contractor shall obtain, at Contractor's own expense such permits, certificates, and licenses as may be required in the performance of the specified work.

45. Laws And Ordinances

Contractor shall at all times observe and comply with all Federal, State and Local Laws, ordinances and regulations which in any manner effect the contract or the work, and shall indemnify and save harmless the County against any claim arising from the violation of any such laws and ordinances, whether by Contractor or its employees.

46. Permits And Licenses

Contractor shall be responsible for obtaining and furnishing all necessary permits and licenses, City, County, State or Federal as are required for the performance of this contract.

47. Lines And Grades

The Engineer will furnish points for horizontal and vertical control. Any additional stakes required by the Contractor shall be set at his expense. Whenever necessary, work shall be suspended to permit this work, but such suspension will be as brief as practicable and the Contractor shall be allowed no extra compensation therefor. The Contractor shall give the Engineer ample notice of the time and place where control lines and

bench marks will be needed. All control stakes, marks, etc. shall be carefully preserved by the Contractor, and in case of careless destruction or removal by him or his employees, such control stakes, marks, etc. shall be replaced by the Engineer at the Contractor's expense.

48. Excess, Waste Material And Debris

All excess material, waste material and debris shall become the property of the Contractor and shall be properly disposed of off-site. No separate payment shall be made for same.

49. Material Hauling

Hauling of materials will not be paid for directly, but shall be considered as subsidiary work pertaining to the respective bid items. Haul routes for full and empty loads shall be restricted to State Highways. Hauling of equipment is also restricted to State Highways.

50. Abatement And Mitigation Of Excessive Or Unnecessary Construction Noise

Throughout all phases of the construction of this project, including the moving, unloading, operating and handling of construction equipment prior to commencement of work, during the project and after the work is complete, the contractor shall make every reasonable effort to minimize the noise imposed upon the immediate neighborhood surrounding the area of construction. Particular and special efforts shall be exercised by the Contractor to avoid the creation of unnecessary noise impacts on adjacent sensitive receptors in the placement of non-mobile equipment such as air compressors, generators, pumps, etc. The placement of temporary parked mobile equipment with the engine running shall be such as to cause the least disruption of normal adjacent activities not associated with the work to be performed by the contractor.

All equipment associated with the work shall be equipped with components designed by the manufacturer wholly or in part to suppress excessive noise and these components shall be maintained in their original operating condition considering normal depreciation. Noise-attenuation devices installed by the manufacturer such as mufflers, engine covers, insulation, etc., shall not be removed nor rendered ineffectual nor be permitted to remain off the equipment while the equipment is in use.

51. Working Hours

Work shall not be commenced by the contractor before sunrise and shall be so conducted that all equipment is off the road and safely stored by sunset. Specific permission shall be obtained by the contractor from the Engineer for work during those hours between 7:00 P.M. and 6:00 A.M. of the following day.

52. Pipeline, Utility Locations And Contractor Responsibility

An effort to determine all pipelines and utilities which may impact the project has been made. All known pipelines and utilities have been approximately located and shown on the plans. The Contractor shall notify all utility and pipeline owners before beginning the work. Additional unknown utilities and pipelines may be found. Adjustments of these utilities or pipelines shall be done by others at no expense to the contractor. However, the Contractor shall cooperate and coordinate his work with the adjustment

The Contractor will anticipate this in making his bid. The contractor will not be allowed claims for damages or delays for these adjustments should they be necessary. However, additional time will be considered for the contract period.

This action, however, shall in no way be interpreted as relieving the Contractor of his responsibilities under the terms of the contract as set out in the plans and specifications. The Contractor shall repair any damage to the facilities caused by his operations at the Contractor's expense and shall restore facilities to service in a timely manner.

53. Incidentals

All items of work required under this contract not specifically called for in the proposal as pay items shall be considered incidental to the various bid items and no separate payment shall be made for same.

54. Flagmen

During certain phases of construction flagmen will be required to direct and control traffic. This work will not be paid for directly, but shall be considered incidental the various bid items and no separate payment shall be made for same.

55. Field Office

For this project the Contractor will not have to provide a field office.

56. Wage Rates:

The attached schedule of wages per hour for this Contract follows.

"General Decision Number: TX20210038 01/01/2021

Superseded General Decision Number: TX20200038

State: Texas

Construction Type: Highway

Counties: Austin, Brazoria, Chambers, Fort Bend, Galveston, Hardin, Harris, Jefferson, Liberty, Montgomery, Orange, San Jacinto and Waller Counties in Texas.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/01/2021

* SUTX2011-013 08/10/2011

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER (Paving and Structures).....	\$ 12.98	
ELECTRICIAN.....	\$ 27.11	

FORM BUILDER/FORM SETTER

Paving & Curb.....\$ 12.34
Structures.....\$ 12.23

LABORER

Asphalt Raker.....\$ 12.36
Flagger.....\$ 10.33
Laborer, Common.....\$ 11.02
Laborer, Utility.....\$ 11.73
Pipelayer.....\$ 12.12
Work Zone Barricade
Servicer.....\$ 11.67

PAINTER (Structures).....\$ 18.62

POWER EQUIPMENT OPERATOR:

Asphalt Distributor.....\$ 14.06
Asphalt Paving Machine.....\$ 14.32
Broom or Sweeper.....\$ 12.68
Concrete Pavement
Finishing Machine.....\$ 13.07
Concrete Paving, Curing,
Float, Texturing Machine....\$ 11.71
Concrete Saw.....\$ 13.99
Crane, Hydraulic 80 Tons
or less.....\$ 13.86
Crane, Lattice boom 80
tons or less.....\$ 14.97
Crane, Lattice boom over
80 Tons.....\$ 15.80
Crawler Tractor.....\$ 13.68
Excavator, 50,000 pounds
or less.....\$ 12.71
Excavator, Over 50,000
pounds.....\$ 14.53
Foundation Drill, Crawler
Mounted.....\$ 17.43
Foundation Drill, Truck
Mounted.....\$ 15.89
Front End Loader 3 CY or
Less.....\$ 13.32
Front End Loader, Over 3 CY.\$ 13.17
Loader/Backhoe.....\$ 14.29
Mechanic.....\$ 16.96
Milling Machine.....\$ 13.53
Motor Grader, Fine Grade....\$ 15.69
Motor Grader, Rough.....\$ 14.23
Off Road Hauler.....\$ 14.60
Pavement Marking Machine...\$ 11.18
Piledriver.....\$ 14.95
Roller, Asphalt.....\$ 11.95
Roller, Other.....\$ 11.57
Scraper.....\$ 13.47
Spreader Box.....\$ 13.58

Servicer.....\$ 13.97

Steel Worker

Reinforcing Steel.....\$ 15.15
Structural Steel Welder.....\$ 12.85
Structural Steel.....\$ 14.39

TRUCK DRIVER

Low Boy Float.....\$ 16.03

Single Axle.....\$ 11.46
 Single or Tandem Axle Dump..\$ 11.48
 Tandem Axle Tractor w/Semi
 Trailer.....\$ 12.27

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

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 Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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

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

Union Rate Identifiers

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

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

this classification and rate.

Survey Rate Identifiers

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

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

Union Average Rate Identifiers

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

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

WAGE DETERMINATION APPEALS PROCESS

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

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

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

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

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

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

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

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

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

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

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

=====

END OF GENERAL DECISION

..

BID PROPOSAL

The bidder hereby proposes to furnish all labor, material, equipment and incidentals for:

Daniel Dror Avenue

Enclosed is a Cashier's Check or Bid Bond in the sum of 5% of the greatest amount bid.

Bidder agrees to perform in accordance with the requirements of the contract documents in consideration of payment by the County of the prices in this proposal.

IN CASE OF DISCREPANCY BETWEEN UNIT PRICES AND EXTENDED PRICES, UNIT PRICES WILL GOVERN.

This bid sheet must be completely filled out in ink or typewritten with any necessary supplemental information attached.

The undersigned hereby agrees to all of the foregoing terms and provisions and to all terms and provisions of the contract, if awarded, which includes all provisions of this bid package.

BIDDER _____

SIGNATURE _____

PRINT NAME _____

TITLE _____

ADDRESS _____

CITY, STATE _____

ZIP _____

TELEPHONE _____

FAX NO _____

DATE _____

TAX I.D. No. _____

**BID PROPOSAL
DANIEL DROR AVENUE**

ITEM NO.	SPEC. NO.	DESCRIPTION ⁽¹⁾	UNIT	QUAN.	UNIT PRICE IN WORDS	UNIT PRICE ⁽²⁾	TOTAL PRICE
DANIEL DROR AVE							
1	DRAWING	PROJECT SIGN	EA	2	_____ DOLLARS AND _____ CENTS		
2		MOBILIZATION (5%)	LS	1	_____ DOLLARS AND _____ CENTS		
3	104 HCED	REMOVE AND DISPOSE OF EXISTING PAVEMENT	SY	471	_____ DOLLARS AND _____ CENTS		
4	104 HCED	REMOVE AND DISPOSE OF EXISTING SIDEWALK	SY	48	_____ DOLLARS AND _____ CENTS		
5	104 HCED	REMOVE AND DISPOSE OF EXISTING MEDIAN CURB	LF	163	_____ DOLLARS AND _____ CENTS		
6	550 HCED	REMOVE EXISTING BARBED-WIRE FENCE	LF	800	_____ DOLLARS AND _____ CENTS		
7	110 HCED	ROADWAY EXCAVATION	CY	6,754	_____ DOLLARS AND _____ CENTS		
8	120 HCED	ROADSIDE DITCH GRADING	LF	2,652	_____ DOLLARS AND _____ CENTS		
9	221 HCED	HYDRATED LIME (SLURRY)	TON	152	_____ DOLLARS AND _____ CENTS		
10	220 HCED	LIME-STABILIZED SUBGRADE (6-INCH THICK)	SY	6,754	_____ DOLLARS AND _____ CENTS		
11	360 HCED	REINFORCED CONCRETE PAVEMENT (7-INCH THICK)	SY	4,634	_____ DOLLARS AND _____ CENTS		
12	530 HCED	REINFORCED CONCRETE SIDEWALK (4-INCH THICK)	SY	16	_____ DOLLARS AND _____ CENTS		
13	530 HCED	REINFORCED CONCRETE CURBS (6-INCH TALL)	LF	158	_____ DOLLARS AND _____ CENTS		
14	460 HCED	24-INCH REINFORCED CONCRETE PIPE, CLASS III, ALL DEPTHS	LF	30	_____ DOLLARS AND _____ CENTS		

**BID PROPOSAL
DANIEL DROR AVENUE**

ITEM NO.	SPEC. NO.	DESCRIPTION ⁽¹⁾	UNIT	QUAN.	UNIT PRICE IN WORDS	UNIT PRICE ⁽²⁾	TOTAL PRICE
15	493 HCED	GRADE NO. 1 RIPRAP (18-INCH THICK)	SY	45	DOLLARS AND _____ CENTS		
16	360, 361 HCED	PAVEMENT CONNECTION AT FM 518	LS	1	DOLLARS AND _____ CENTS		
17	360, 361 HCED	PAVEMENT CONNECTION AT HANSON ROAD	LS	2	DOLLARS AND _____ CENTS		
18	660 HCED	PAVEMENT MARKINGS AND STRIPING	LS	1	DOLLARS AND _____ CENTS		
19	165 HCED	HYDROMULCH SEEDING	AC	1	DOLLARS AND _____ CENTS		
20	724 HCED	STABILIZED CONSTRUCTION EXIT	SY	139	DOLLARS AND _____ CENTS		
21	713 HCED	REINFORCED FILTER FABRIC FENCE	LF	1,785	DOLLARS AND _____ CENTS		
22	730 HCED	CONCRETE TRUCK WASHOUT	EA	1	DOLLARS AND _____ CENTS		
23	556 HCED	BARBED-WIRE FENCE	LF	2,553	DOLLARS AND _____ CENTS		
24	531 HCED	WHEELCHAIR RAMP	SF	50	DOLLARS AND _____ CENTS		
25	424, 472 HCED	PROPOSED GRATE INLET	EA	1	DOLLARS AND _____ CENTS		
26	671 HCED	TRAFFIC CONTROL	LS	1	DOLLARS AND _____ CENTS		
					SUBTOTAL		

**BID PROPOSAL
DANIEL DROR AVENUE**

ITEM NO.	SPEC. NO.	DESCRIPTION ⁽¹⁾	UNIT	QUAN.	UNIT PRICE IN WORDS	UNIT PRICE ⁽²⁾	TOTAL PRICE
FM 518							
27	104 TxDOT	REMOVING CONC (PAV) (0104-6001)	SY	100	DOLLARS AND _____ CENTS		
28	104 TxDOT	REMOVING CONC (CURB) (0104-6021)	LF	500	DOLLARS AND _____ CENTS		
29	110 TxDOT	EXCAVATION (GRASS MEDIAN) (0110-6001)	CY	108	DOLLARS AND _____ CENTS		
30	360 TxDOT	CONC PVMT (CONT REINF - CRCP) (9") (0360-6003)	SY	420	DOLLARS AND _____ CENTS		
31	260 TxDOT	LIME(HYD, COM OR QK)(SLRY) OR QK(DRY) (0260-6012)	TON	7	DOLLARS AND _____ CENTS		
32	276 TxDOT	CEMENT TREATED BASE (PLNT MX) (CL N)(TY E)(GR 4)(6")(0276-6224)	SY	510	DOLLARS AND _____ CENTS		
33	292 TxDOT	ASPHALT STAB BASE (GR 4)(PG 64)(0292-6017)	TON	1	DOLLARS AND _____ CENTS		
34	360 TxDOT	CONC CURB (6") (0110-6001)	LF	307	DOLLARS AND _____ CENTS		
35	416 TxDOT	DRILL SHAFT (TRF SIG POLE) (36 IN) (0416-6032)	LF	56	DOLLARS AND _____ CENTS		
36	618 TxDOT	CONDT (PVC) (SCH 80) (4") (0618-6058)	LF	145	DOLLARS AND _____ CENTS		
37	618 TxDOT	CONDT (PVC) (SCH 80) (4") (BORE) (0618-6059)	LF	265	DOLLARS AND _____ CENTS		
38	620 TxDOT	ELEC CONDR (NO 6) BARE (0620-6009)	LF	60	DOLLARS AND _____ CENTS		
39	620 TxDOT	ELEC CONDR (NO 4) INSULATED (0620-6012)	LF	60	DOLLARS AND _____ CENTS		

**BID PROPOSAL
DANIEL DROR AVENUE**

ITEM NO.	SPEC. NO.	DESCRIPTION ⁽¹⁾	UNIT QUAN.	UNIT PRICE IN WORDS	UNIT PRICE ⁽²⁾	TOTAL PRICE
40	621 TxDOT	TRAY CABLE (4 CONDR) (12 AWG) (0621-6005)	LF 300	DOLLARS AND _____ CENTS		
41	624 TxDOT	GROUND BOX TY A (122311) W/ APRON (0624-6002)	EA 3	DOLLARS AND _____ CENTS		
42	624 TxDOT	GROUND BOX TY D (162922) W/ APRON (0624-6010)	EA 3	DOLLARS AND _____ CENTS		
43	628 TxDOT	ELC SRB TY D 120/240 060(NS)SS(E)SP(O) (0628-6145)	EA 1	DOLLARS AND _____ CENTS		
44	636 TxDOT	ALUMINUM SIGNS (TY A) (0636-6001)	SF 38	DOLLARS AND _____ CENTS		
45	680 TxDOT	INSTALL HWY TRF SIG (ISOLATED) (0680-6002)	EA 1	DOLLARS AND _____ CENTS		
46	682 TxDOT	VEH SIG SEC (12") LED (YEL) (0682-6003)	EA 6	DOLLARS AND _____ CENTS		
47	682 TxDOT	VEH SIG SEC (12") LED (RED) (0682-6005)	EA 4	DOLLARS AND _____ CENTS		
48	682 TxDOT	BACK PLATE (12") (1 SEC) (0682-6021)	EA 10	DOLLARS AND _____ CENTS		
49	684 TxDOT	TRF SIG CBL (TY A) (12 AWG) (2 CONDR) (0684-6007)	LF 915	DOLLARS AND _____ CENTS		
50	684 TxDOT	TRF SIG CBL (TY A) (12 AWG) (4 CONDR) (0684-6009)	LF 915	DOLLARS AND _____ CENTS		
51	684 TxDOT	TRF SIG CBL (TY A) (12 AWG) (7 CONDR) (0684-6012)	LF 1,530	DOLLARS AND _____ CENTS		
52	686 TxDOT	INS TRF SIG PL AM(S)1 ARM (36') LUM (0686-6039)	EA 2	DOLLARS AND _____ CENTS		
53	686 TxDOT	INS TRF SIG PL AM(S)1 ARM (40') (0686-6041)	EA 2	DOLLARS AND _____ CENTS		

**BID PROPOSAL
DANIEL DROR AVENUE**

ITEM NO.	SPEC. NO.	DESCRIPTION ⁽¹⁾	UNIT	QUAN.	UNIT PRICE IN WORDS	UNIT PRICE ⁽²⁾	TOTAL PRICE
54	SS6007 TxDOT	FIBER OPTIC CBL (SNGLE-MODE) (144 FIBER) (6007-6017)	LF	790	DOLLARS AND CENTS		
55	SS6007 TxDOT	FIBER OPTIC SPLICE ENCLOSURE (6007-6021)	EA	1	DOLLARS AND CENTS		
56	SS6007 TxDOT	REMOVE FIBER OPTIC CABLE (6007-6103)	LF	790	DOLLARS AND CENTS		
57	SS6054 TxDOT	COAXIAL CABLE (6054-6002)	LF	745	DOLLARS AND CENTS		
58	SS6058 TxDOT	BBU SYSTEM (EXTERNAL BATT CABINET) (6058-6001)	EA	1	DOLLARS AND CENTS		
59	SS6083 TxDOT	VID IMAGE AND RADAR COM CABLE (COAX) (6083-6005)	LF	365	DOLLARS AND CENTS		
SUBTOTAL							

SUBTOTAL DANIEL DROR AVE

SUBTOTAL FM 518

TOTAL BASE BID (DANIEL DROR AVE + FM 518)

Notes:

- ⁽¹⁾ The intent of the Contract Documents is for the Contractor to include all items necessary for the proper execution and completion of the Work described in the Contract Documents. No separate measurement and payment shall be made for any work unless identified as a pay item in the BID. Include the cost of work not identified as a separate pay item in Contract price bid for items of which this work is a component. In case of discrepancy between measurement and payment within the BID and Technical Specification Section, the BID shall govern.
- ⁽²⁾ In the event of a discrepancy, this column shall govern.

CONTRACT AWARD

CONTRACT FOR: Daniel Dror Avenue

THIS CONTRACT IS ENTERED INTO BETWEEN GALVESTON COUNTY AND THE CONTRACTOR NAMED BELOW PURSUANT TO SUBCHAPTER B, CHAPTER 271, TEXAS LOCAL GOVERNMENT CODE, AND THE REFERENCED INVITATION TO BID.

Contract No: 21-1125

Bid No: B211031

Contractor: _____

The Specifications and Drawings are enumerated as follows:

Standard Specifications:

Texas Department Of Transportation, 2014

Standard Specifications For Construction And Maintenance Of Highways, Streets And Bridges

Harris County Engineering Department, 2017

Standard Specifications For Construction and Maintenance of Roads and Bridges

GENERAL: The above listed specification items are those under which payment is to be made. These, together with such other pertinent items, if any as may be referred to in the above listed specification items, and including the special provisions listed above, constitute the complete specification for this project. No separate payment will be made for any item that is not specifically set further in the bid sheets and all costs therefore shall be included in the prices named in the bid sheets for the various appurtenant items of work.

List of Specifications:

HCED

104	Removing Old Concrete
110	Roadway Excavation
120	Excavation for Channels and Other Drainage Facilities
165	Hydro-Mulch Seeding (for Erosion Control and Stabilization)
220	Lime Stabilized Subgrade
221	Hydrated Lime and Lime Slurry
360	Concrete Pavement
361	Full Depth Repair of Concrete Pavement
424	Extending Concrete Structures
460	Reinforced Concrete Pipe
472	Inlets

493	Riprap
495	Removing Old Structures
530	Concrete Curb, Concrete Curb and Gutter, Sidwalks, and Driveways
531	Coloring Concrete for ADA Ramps
550	Existing Fencing and Gates
556	Four Strand Barbed Wire Fence
660	Reflectorized Pavement Markings
671	Traffic Control
713	Reinforced Filter Fabric Barrier
724	Stabilized Construction Access
730	Concrete Truck Washout Structures

TxDOT

104	Removing Concrete
110	Excavation
260	Lime Treatment (Road-Mixed)
276	Cement Treatment (Plant-Mixed)
292	Asphalt Treatment (Plant-Mixed)
360	Concrete Pavement
416	Drill Shaft Foundations
618	Conduit
620	Electrical Conductors
621	Tray Cable
624	Ground Boxes
628	Electrical Services
636	Signs
680	Highway Traffic Signals
682	Vehicle and Pedestrian Signal Heads
684	Traffic Signal Cables
686	Traffic Signal Pole Assemblies (Steel)
687	Pedestal Pole Assemblies
688	Pedestrian Detectors and Vehicle Loop Detectors
SS6007	Intelligent Transportation System (ITS) Fiber Optic Cable
SS6054	Spread Spectrum Radios for Traffic Signals
SS6058	Battery Back-Up System for Signal Cabinets
SS6083	Video Imaging and Radar Vehicle Detection System
SS6292	Radar Vehicle Detection System for Signalized Intersection Control

Special Provisions: HC Item 1
 TxDOT Items 1-9

Special Items: City of Houston Item 01270

DRAWINGS: 1 thru 65

ADDENDA: _____

Contract Award (continued)

Invitation to Bid, General Provisions, Special Provisions, Bid Forms, Non-Collusion Affidavit, Vendor Qualification Packet, Debarment Form, Special Provisions for Construction, Bid Proposal, Affidavit and Surety Forms, Wage Rates, Specifications and Plans attached to this Contract Award are all made a part of this Contract and collectively evidence and constitute the entire contract. Contractor shall furnish all materials, perform all of the work required to be done and do everything else required by these documents.

Time of Completion: The Contractor shall complete the work within 150 Calendar Days of the issuance of the notice to proceed. The time set forth for completion of the work is an essential element of the Contract.

The Contract Sum: The County shall pay the Contractor for performance of the Contract, the sum of _____

Dollars and ___/100 (\$ _____), payments to be made as described herein.

Performance Bond required: (x) yes () no
Payment Bond required: (x) yes () no

This Contract is issued pursuant to award made by Commissioners' Court on _____, 20__.

EXECUTED this ____ day of _____, 20__.

COUNTY OF GALVESTON, TEXAS

BY: _____
MARK HENRY, County Judge

ATTEST:

DWIGHT SULLIVAN, County Clerk

CONTRACTOR

BY: _____
Signature - Title

Printed Name

CONSENT OF SURETY COMPANY TO FINAL PAYMENT

TO (Owner):

PROJECT NO:

PROJECT:
(name, address)

CONTRACT FOR:

CONTRACT DATE:

CONTRACTOR:

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(here insert name and address of Surety as it appears in the bond).

, SURETY COMPANY,

on bond of (here insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety
Company of any of its obligations to (here insert name and address of Owner)

, OWNER,

as set forth in the said Surety Company's bond.

IN WITNESS WHEREOF,
the Surety Company has hereunto set its had this

day of _____ 20__ .

Surety Company

Signature of Authorized Representative

Title

ATTEST:
(Seal):

NOTE: This form is to be use as a companion document to Contractor's Affidavit of Payment of Debts and Claims.

CONSENT OF SURETY TO REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE

TO (Owner):

PROJECT NO:

PROJECT:
(name, address)

CONTRACT FOR:

CONTRACT DATE:

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(here insert name and address of Surety as it appears in the bond).

, SURETY,

on bond of (here insert name and address of Contractor as it appears in the bond)

, CONTRACTOR,

hereby approves the reduction in or partial release of retainage to the contractor as follows:

The Surety agrees that such reduction in or partial release of retainage to the Contractor shall not relieve the Surety of any of its
obligations to (here insert name and address of Owner)

, OWNER,

as set forth in the said Surety's bond.

IN WITNESS WHEREOF,
the Surety has hereunto set its had this

day of

20 .

Surety

Signature of Authorized Representative

Title

ATTEST:
(Seal):

CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS

TO (Owner):

PROJECT NO:

CONTRACT FOR:

PROJECT:
(name, address)

CONTRACT DATE:

State of:

County of:

The undersigned, hereby certifies that, except as listed below, he has paid in full or has otherwise satisfied all obligations for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or his property might in any way be held responsible.

EXCEPTIONS: (If none, write "None". If required by the Owner, the Contractor shall furnish bond satisfactory to the Owner for each exception.)

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment.
Whenever Surety is involved, consent of Surety is required. CONSENT OF SURETY, may be used for this purpose.
Indicate attachment: yes _____ no _____

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers to the extent required by the Owner, accompanied by a list thereof.
3. Contractor's Affidavit of Release of Liens.

CONTRACTOR:

Address:

BY:

Subscribed and sworn to before me this

day of _____ 20

Notary Public:

My Commission Expires:

CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIEN

TO (Owner):

PROJECT NO:

CONTRACT FOR:

PROJECT:
(name, address)

CONTRACT DATE:

State of:

County of:

The undersigned, hereby certifies that, to the best of his knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS: (If none, write "None". If required by the Owner, the Contractor shall furnish bond satisfactory to the Owner for each exception.)

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Sub-contractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR:

Address:

BY:

Subscribed and sworn to before me this

day of 20

Notary Public:

My Commission Expires:

01110
PROJECT SCOPE

1. Project Scope

Under this contract, the Contractor shall furnish all materials, appliances, tools, equipment, transportation, services and all labor and superintendence necessary for construction of the work as described in these Specifications and as shown on the Plans and Exhibits. The completed installation shall not lack any part which can be reasonably implied as necessary to its proper functioning nor any subsidiary item which is customarily furnished, and the Contractor shall deliver the completed and operating installation to the Owner.

Work in General under this contract includes, but is not limited to, the following:

The intent of this project is to provide a new concrete road with roadside ditches to connect Hanson Road and FM 518. The new road will vary in width from 20-feet to 38-feet and is to be constructed within a proposed 50-foot Right-of-Way. The road will consist of 7-inch thick concrete with a 6-inch thick subgrade, roadside ditches on both sides, a 24-inch reinforced concrete pipe culvert, connections to existing Hanson Road, FM 518, roadside ditches and sidewalks, pavement markings, traffic control, traffic signage, ADA ramps, and a traffic signal at the intersection of the proposed road and FM 518.

The existing condition of the proposed roadway corridor is open pasture utilized for agriculture and is adjacent to a CenterPoint Energy easement. The project is located between Home Depot at Hanson Road and AutoZone at FM 518. There is a barbed wire fence in the southern half of the project and at Hanson that will require the removal and replacement in order to install the new road.

CenterPoint Energy has relocated their poles/facilities within the project vicinity. Frontier Communications will also have to relocate one of their utility lines prior to construction in this area. Utility coordination and relocation is at no cost to the contractor. No other conflicts are anticipated to slow construction.

The connection to FM 518 will require coordination with TxDOT to install the traffic signal in an interim state and Galveston County Water Control & Improvement District No. 12 to modify the existing fire hydrant as noted on the plans.

Item 104

Removing Concrete



1. DESCRIPTION

Break, remove, and salvage or dispose of existing hydraulic cement concrete.

2. CONSTRUCTION

Remove existing hydraulic cement concrete from locations shown on the plans. Avoid damaging concrete that will remain in place. Saw-cut and remove the existing concrete to neat lines. Replace any concrete damaged by the Contractor at no expense to the Department. Accept ownership and properly dispose of broken concrete in accordance with federal, state, and local regulations unless otherwise shown on the plans.

3. MEASUREMENT

Removing concrete pavement, floors, porches, patios, riprap, medians, foundations, sidewalks, driveways, and other appurtenances will be measured by the square yard (regardless of thickness) or by the cubic yard of calculated volume, in its original position.

Removing curb, curb and gutter, and concrete traffic barrier will be measured by the foot in its original position. The removal of monolithic concrete curb or dowelled concrete curb will be included in the concrete pavement measurement.

Removing retaining walls will be measured by the square yard along the front face from the top of the wall to the top of the footing.

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

4. PAYMENT

The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Removing Concrete" of the type specified. This price is full compensation for breaking the concrete; loading, hauling, and salvaging or disposing of the material; and equipment, labor, tools, and incidentals.

Removing retaining wall footings will not be paid for directly but will be considered subsidiary to this item.

Item 110

Excavation



1. DESCRIPTION

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

2. CONSTRUCTION

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

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

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

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

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

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

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

3. MEASUREMENT

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

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

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

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

4. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Excavation (Roadway)," "Excavation (Channel),"

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

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

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

Item 260

Lime Treatment (Road-Mixed)



1. DESCRIPTION

Mix and compact lime, water, and subgrade or base (with or without asphaltic concrete pavement) in the roadway.

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.

- 2.1. **Lime.** Furnish lime that meets the requirements of [DMS-6350](#), "Lime and Lime Slurry," and [DMS-6330](#), "Pre-Qualification of Lime Sources." Use hydrated lime, commercial lime slurry, quicklime, or carbide lime slurry as shown on the plans. Do not use quicklime when sulfates are present in quantities greater than 3,000 ppm. When furnishing quicklime, provide it in bulk.
- 2.2. **Subgrade.** The Engineer will determine the sulfate content of the existing subgrade in accordance with [Tex-145-E](#) and organic content in accordance with [Tex-148-E](#) before lime treatment begins. Suspend operations when material to be treated has a sulfate content greater than 7,000 ppm or an organic content greater than 1.0% and proceed as directed.
- 2.3. **Flexible Base.** Unless otherwise shown on the plans, furnish base material that meets the requirements of Item 247, "Flexible Base," for the type and grade shown on the plans, before the addition of lime.
- 2.4. **Water.** Furnish water free of industrial wastes and other objectionable material.
- 2.5. **Asphalt.** When asphalt or emulsion is permitted for curing purposes, furnish materials that meet the requirements of Item 300, "Asphalts, Oils, and Emulsions," as shown on the plans or as directed.
- 2.6. **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. Limit the amount of recycled asphalt pavement to no more than 50% of the mix unless otherwise shown on the plans or directed.

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.

- 3.1. **Storage Facility.** Store quicklime and dry hydrated lime in closed, weatherproof containers.
- 3.2. **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.

- 3.3. 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 or carbide lime slurry.
- 3.4. **Hydrated Lime Distribution Equipment.** Provide equipment to spread lime evenly across the area to be treated. Provide equipment with a rotary vane feeder to spread lime, when shown on the plans.
- 3.5. **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.

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.

- 4.1. **Preparation of Subgrade or Existing Base for Treatment.** Before treating, remove existing asphalt pavement in accordance with Item 105, "Removing Treated and Untreated Base and Asphalt 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.

Unless otherwise approved, proof roll the roadbed in accordance with Item 216, "Proof Rolling," before pulverizing or scarifying existing material. Correct soft spots as directed.

When material is imported from a borrow source, notify the Engineer of the location of the borrow source well in advance to allow time for testing and approval to avoid delay to the project. Stockpile as directed. The Engineer will test the borrow source and determine the sulfate and organic contents. When the borrow source has a sulfate content greater than 3,000 ppm or an organic content greater than 1.0%, proceed 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.

- 4.2. **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.

- 4.3. **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 260.2.6., "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.

- 4.3.1. **Dry Placement.** Before applying lime, bring the prepared roadway to approximately 2 percentage points above optimum moisture content. When necessary, sprinkle in accordance with Item 204, "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.
- 4.3.2. **Slurry Placement.** Provide slurry free of objectionable materials, at or above the minimum dry solids content, and with a uniform consistency that will allow ease of handling and uniform application. Deliver commercial lime slurry or carbide lime slurry to the jobsite, or use hydrated lime or quicklime to prepare lime slurry at the jobsite or other approved location, as specified. When dry quicklime is applied as slurry, use 80% of the amount shown on the plans.
- 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.
- 4.4. **Mixing.** Begin mixing within 6 hr. of application of lime. Hydrated lime exposed to the open air for 6 hr. 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. When treating subgrade, bring the moisture content above the optimum moisture content to insure adequate chemical reaction of the lime and subgrade materials. 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. When the material to be treated has a sulfate content greater than 3,000 ppm but less than or equal to 7,000 ppm, mellow for a minimum of 7 days. Maintain in a continuously moist condition by sprinkling in accordance with Item 204, "Sprinkling." After mellowing, resume mixing until a homogeneous, friable mixture is obtained. After mixing, the Engineer may 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"	100	100
3/4"	85	85
#4	–	60

- 4.5. **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. Sprinkle the treated material in accordance with Item 204, "Sprinkling" or aerate the treated material to adjust the moisture content during compaction so that it is no more than 1.0 percentage points below optimum and 2.0 percentage points above optimum as determined by [Tex-121-E](#). Measure the moisture content of the material in accordance with [Tex-115-E](#) or [Tex-103-E](#) during compaction daily and report the results the same day, unless otherwise shown on the plans or directed.

Begin rolling longitudinally at the sides and proceed toward the center, overlapping on successive trips by at least 1/2 the width of the roller 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.

Before final acceptance, the Engineer will select the locations of tests in each unit and measure the treated depth in accordance with [Tex-140-E](#). Correct areas deficient by more than 1/2 in. in thickness or more than 1/2% in target lime content by adding lime as required, reshaping, recompacting, and refinishing at the Contractor's expense.

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. Rework in accordance with Section 260.4.6., "Reworking a Section." Perform the work at no additional expense to the Department.

- 4.5.1. **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 recompacting.
- 4.5.2. **Density Control.** The Engineer will determine roadway density and moisture content 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.
- 4.5.2.1. **Subgrade.** Compact to at least 95% of the maximum density determined in accordance with [Tex-121-E](#), unless otherwise shown on the plans.
- 4.5.2.2. **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.
- 4.6. **Reworking a Section.** When a section is reworked within 72 hr. 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 260.2.6., "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.
- 4.7. **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 subgrade 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 subgrade to within 0.1 ft. in the cross-section and 0.1 ft. in 16 ft. measured longitudinally.
- Correct grade deviations of constructed base greater than 1/4 in. in 16 ft. measured longitudinally or greater than 1/4 in. over the entire width of the cross-section in areas where surfacing is to be placed. Remove excess material, reshape, and roll with a pneumatic-tire roller. Correct as directed if material is more than 1/4 in. low. Do not surface patch. The 72-hr. time limit required for completion of placement, compaction, and finishing does not apply to finishing required just before applying the surface course.
- 4.8. **Curing.** Cure for the minimum number of days shown in Table 2 by sprinkling in accordance with Item 204, "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 Section 132.3.5., "Maintenance of Moisture and Reworking," for subgrade and Section 247.4.5., "Curing" for bases before 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 Courses¹

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

1. Subject to the approval of the Engineer. Proof rolling may be required as an indicator of adequate curing.

5. MEASUREMENT

- 5.1. **Lime.** When lime is furnished in trucks, the weight of lime will be determined on certified scales, or the Contractor must provide a set of standard platform truck scales at a location approved by the Engineer. Scales must conform to the requirements of Item 520, "Weighing and Measuring Equipment."

When lime is furnished in bags, indicate the manufacturer's certified weight. Bags varying more than 5% from that weight may be rejected. The average weight of bags in any shipment, as determined by weighing 10 bags taken at random, must be at least the manufacturer's certified weight.

- 5.1.1. **Hydrated Lime.**
- 5.1.1.1. **Dry.** Lime will be measured by the ton (dry weight).
- 5.1.1.2. **Slurry.** Lime slurry will be measured by the ton (dry weight) of the hydrated lime used to prepare the slurry at the jobsite.
- 5.1.2. **Commercial Lime Slurry.** Lime slurry will be measured by the ton (dry weight) as calculated from the minimum percent dry solids content of the slurry, multiplied by the weight of the slurry in tons delivered.
- 5.1.3. **Quicklime.**
- 5.1.3.1. **Dry.** Lime will be measured by the ton (dry weight) of the quicklime.
- 5.1.3.2. **Slurry.** Lime slurry will be measured by the ton (dry weight) of the quicklime used to prepare the slurry multiplied by a conversion factor of 1.28 to give the quantity of equivalent hydrated lime, which will be the basis of payment.
- 5.1.4. **Carbide Lime Slurry.** Lime slurry will be measured by the ton (dry weight) as calculated from the minimum percent dry solids content of the slurry, multiplied by the weight of the slurry in tons delivered.
- 5.2. **Lime Treatment.** Lime treatment will be measured by the square yard of surface area. The dimensions for determining the surface area are established by the widths shown on the plans and the lengths measured at placement.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid in accordance with Section 260.6.1., "Lime," and Section 260.6.2., "Lime Treatment."

Furnishing and delivering new base will be paid for in accordance with Section 247.6.2., "Flexible Base (Roadway Delivery)." Mixing, spreading, blading, shaping, compacting, and finishing new or existing base material will be paid for in accordance with Section 260.6.2., "Lime Treatment." Removal and disposal of existing asphalt concrete pavement will be paid for in accordance with pertinent Items or Article 4.4., "Changes in the Work."

Sprinkling and rolling, except proof rolling, will not be paid for directly but will be subsidiary to this Item, unless otherwise shown on the plans. When proof rolling is shown on the plans or directed by the Engineer, it will be paid for in accordance with Item 216, "Proof Rolling."

Where subgrade is constructed under this Contract, correction of soft spots in the subgrade or existing base will be at the Contractor's expense. Where subgrade is not constructed under this Contract, correction of soft spots in the subgrade or existing base will be paid for in accordance with pertinent Items or Article 4.4., "Changes in the Work."

Where subgrade to be treated under this Contract has sulfates greater than 7,000 ppm, work will be paid for in accordance with Article 4.4., "Changes in the Work."

Asphalt used solely for curing will not be paid for directly but will be subsidiary to this Item. Asphalt placed for curing and priming will be paid for under Item 310, "Prime Coat."

6.1. **Lime.** Lime will be paid for at the unit price bid for "Lime" of one of the following types:

- Hydrated Lime (Dry),
- Hydrated Lime (Slurry),
- Commercial Lime Slurry,
- Quicklime (Dry),
- Quicklime (Slurry), or
- Carbide Lime Slurry.

This price is full compensation for materials, delivery, equipment, labor, tools, and incidentals.

Lime used for reworking a section in accordance with Section 260.4.6., "Reworking a Section," will not be paid for directly but will be subsidiary to this Item.

6.2. **Lime Treatment.** Lime treatment will be paid for at the unit price bid for "Lime Treatment (Existing Material)," "Lime Treatment (New Base)," or "Lime Treatment (Mixing Existing Material and New Base)," for the depth specified. No payment will be made for thickness or width exceeding that shown on the plans. This price is full compensation for shaping existing material, loosening, mixing, pulverizing, spreading, applying lime, compacting, finishing, curing, curing materials, blading, shaping and maintaining shape, replacing mixture, disposing of loosened materials, processing, hauling, preparing secondary subgrade, water, equipment, labor, tools, and incidentals.

Item 276

Cement Treatment (Plant-Mixed)



1. DESCRIPTION

Construct a base course composed of flexible base, hydraulic cement, and water, mixed in an approved plant.

2. MATERIALS

Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications. Notify the Engineer of proposed sources of materials and of changes in material sources. The Engineer will verify that the specification requirements are met before the sources can be used. The Engineer may sample and test project materials at any time before compaction. Use [Tex-100-E](#) for material definitions.

- 2.1. **Cement.** Furnish hydraulic cement that meets the requirements of [DMS-4600](#), "Hydraulic Cement," and the Department's *Hydraulic Cement Quality Monitoring Program* (HCQMP). Sources not on the HCQMP will require testing and approval before use.
- 2.2. **Flexible Base.** Furnish base material that meets the requirements of Item 247, "Flexible Base," for the type and grade shown on the plans, before the addition of cement.
- 2.3. **Water.** Furnish water that is free of industrial waste and other objectionable material.
- 2.4. **Asphalt.** Furnish asphalt or emulsion that meets the requirements of Item 300, "Asphalts, Oils, and Emulsions," when permitted for curing purposes as shown on the plans or as directed.
- 2.5. **Mix Design.** Using the materials proposed for the project, the Engineer will determine the target cement content and optimum moisture content necessary to produce a stabilized mixture meeting the strength requirements shown in Table 1 for the class specified on the plans. The mix will be designed in accordance with [Tex-120-E](#). The Contractor may propose a mix design developed in accordance with [Tex-120-E](#). The Engineer will use [Tex-120-E](#) to verify the Contractor's proposed mix design before acceptance. The Engineer may use project materials sampled from the plant or the quarry, and sampled by the Engineer or the Contractor, as determined by the Engineer. Limit the amount of asphalt concrete pavement to no more than 50% of the mix unless otherwise shown on the plans or directed.

Table 1
Strength Requirements

Class	7-Day Unconfined Compressive Strength, Min psi
L	500
M	300
N	As shown on the plans

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.

- 3.1. **Cement Storage Facility.** Store cement in closed, weatherproof containers.

- 3.2. **Mixing Plant.** Provide a stationary pugmill, weigh-batch, or continuous mixing plant as approved. Equip plants with automatic proportioning and metering devices that produce a uniform mixture of base material, cement, and water in the specified proportions.
- 3.3. **Spreader Equipment.** Provide equipment that will spread the cement-treated mixture in a uniform layer in 1 pass when shown on the plans. Equip spreaders with electronic grade controls when shown on the plans.

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 established by the Engineer. Start placement operations 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 operations when the Engineer determines that weather conditions are unsuitable.

- 4.1. **Mixing.** Thoroughly mix materials in the proportions designated on the mix design, in a mixing plant that meets the requirements of Section 276.3.2., "Mixing Plant." Mix at optimum moisture content, unless otherwise directed, until a homogeneous mixture is obtained. Do not add water to the mixture after mixing is completed unless directed. The Engineer may sample the mixture to verify strength in accordance with [Tex-120-E](#) and adjust cement content to achieve the target strength for work going forward.
- 4.2. **Placing.** Place the cement-treated base on a subgrade or base prepared in accordance with details shown on the plans. Bring the prepared roadway to the moisture content directed. Haul cement-treated base to the roadway in clean trucks and begin placement immediately. Place cement-treated base only on an area where compacting and finishing can be completed during the same working day. Spread and shape in a uniform layer with an approved spreader. Construct individual layers to the thickness shown on the plans. Maintain the shape of the course by blading. Correct or replace segregated areas as directed, at no additional expense to the Department.
- Construct vertical joints between new cement-treated base and cement-treated base that has been in place 4 hr. or longer. The vertical face may be created by using a header or by cutting back the face to approximately vertical. Place successive base courses using the same methods as the first course. Offset construction joints by at least 6 in.
- 4.3. **Compaction.** Compact each layer immediately after placing. Complete compaction within 2 hr. after plant-mixing water with dry material. Complete compaction of the final lift within 5 hr. after adding water to the treated base used in the first lift when multiple lifts are permitted.

Moisture content in the mixture at the plant may be adjusted so that during compaction it is within 2.0 percentage points of optimum as determined by [Tex-120-E](#). Measure the moisture content of the material in accordance with [Tex-115-E](#) or [Tex-103-E](#) during compaction daily and report the results the same, unless otherwise shown on the plans or directed. Maintain uniform moisture content by sprinkling the treated 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. Begin rolling at the low side and progress toward the high side on superelevated curves. Offset alternate trips of the roller. Operate rollers at a speed between 2 and 6 mph, as directed.

Achieve at least 95% of maximum density determined in accordance with [Tex-120-E](#) when compaction is complete. The Engineer will determine roadway density and moisture content in accordance with [Tex-115-E](#). Remove material that does not meet density requirements. Remove areas that lose required stability, compaction, or finish. Replace with cement-treated mixture, compact, and test in accordance with density control methods.

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.

- 4.4. **Finishing.** Clip, skin, or tight blade the surface of the cement-treated material with a maintainer or subgrade trimmer to a depth of approximately 1/4 in. immediately after completing compaction. 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 increments 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.

Trim 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 in areas where surfacing is to be placed. Remove excess material, reshape, and then roll with a pneumatic tire roller. Correct as directed if material is more than 1/4 in. low. Do not surface patch.

- 4.5. **Microcracking.** Maintain moisture content of the finished cement-treated base for a period of 24 to 48 hr. when shown on the plans. Roll the finished course with a vibratory roller to induce microcracking during this time, but not sooner than 24 hrs. The vibratory roller must be in accordance with Item 210, "Rolling," with a static weight equal to or more than 12 tons and the vibratory drum must be not less than 20 in. wide. The roller must travel at a speed of 2 mph, vibrating at maximum amplitude, and make 2 to 4 passes with 100% coverage exclusive of the outside 1 ft. of the surface crown, unless otherwise directed by the Engineer. Additional passes may be required to achieve the desired crack pattern as directed. Notify the Engineer 24 hr. before the microcracking begins.
- 4.6. **Curing.** Cure for at least 3 days by sprinkling in accordance with Item 204, "Sprinkling," or by applying an asphalt material at the rate of 0.05 to 0.20 gal. per square yard, as shown on the plans or directed. When a section is microcracked, cure section for an additional 2 days after microcracking. Maintain the moisture content during curing at no lower than 2 percentage points below optimum. Continue curing until placing another course.

5. MEASUREMENT

Cement-treated base will be measured by the ton, cubic yard, or square yard as a composite mixture of cement, flexible base, and recycled materials.

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

Measurement is further defined for payment as follows:

- 5.1. **Cubic Yard in Vehicles.** Cement-treated base will be measured by the cubic yard in vehicles as delivered on the road.
- 5.2. **Cubic Yard in Final Position.** Cement-treated base will be measured by the cubic yard in its completed and accepted final position. The volume of each course will be computed in-place between the original subgrade surfaces and the lines, grades, and slopes of the accepted base course as shown on the plans, and calculated by the method of average end areas.
- 5.3. **Square Yard.** Cement-treated base will be measured by the square yard of surface area. The dimensions for determining the surface area are established by the dimensions shown on the plans.
- 5.4. **Ton.** Cement-treated base will be measured by the ton (dry weight) in vehicles as delivered on the road. The dry weight is determined by deducting the weight of the moisture in the material at the time of weighing from

the gross weight of the material. The Engineer will determine the moisture content in the material in accordance with [Tex-103-E](#) from samples taken at the time of weighing.

When material is measured in trucks, the weight of the material will be determined on certified scales, or the Contractor must provide a set of standard platform truck scales at an approved location. Scales must conform to the requirements of Item 520, "Weighing and Measuring Equipment."

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Cement Treatment (Plant-Mix)" of the class (strength), flexible base type, grade, and thickness (for square yard measurement) specified. For cubic yard measurement, "In Vehicle" or "In Final Position" will be specified. This price is full compensation for furnishing and disposing of materials (including cement and base); storing, mixing, hauling, placing, sprinkling, compacting, microcracking, finishing, curing, and maintaining and reworking treated base; and equipment, labor, tools, and incidentals.

Sprinkling and rolling, except proof rolling, will not be paid for directly but will be subsidiary to this Item, unless otherwise shown on the plans. When proof rolling is shown on the plans or directed by the Engineer, it will be paid for in accordance with Item 216, "Proof Rolling."

Where subgrade or base courses are constructed under this Contract, correction of soft spots will be at the Contractor's expense. Where subgrade or base is not constructed under this Contract, correction of soft spots will be paid for in accordance with pertinent Items and Article 4.4., "Changes in the Work."

Asphalt used solely for curing will not be paid for directly but will be subsidiary to this Item. Asphalt placed for curing and priming will be paid for under Item 310, "Prime Coat."

Removal and disposal of existing asphalt concrete pavement will be paid for in accordance with pertinent Items or Article 4.4., "Changes in the Work."

- 6.1. **Thickness Measurement for Cubic Yard In Final Position and Square Yard Payment Adjustment.** Before final acceptance, the Engineer will select the locations of tests within each unit and measure the treated base depths in accordance with [Tex-140-E](#).
- 6.1.1. **Units for Payment Adjustment.**
 - 6.1.1.1. **Roadways and Shoulders.** Units for applying a payment adjustment for thickness to roadways and shoulders are defined as 1,000 ft. of treated base in each placement width. The last unit in each placement width will be 1,000 ft. plus the fractional part of 1,000 ft. remaining. Placement width is the width between longitudinal construction joints. For widening, the placement width is the average width placed of the widened section that is deficient in thickness.
 - 6.1.1.2. **Ramps and Other Areas.** Units are defined as 2,000 sq. yd. or fraction thereof for establishing an adjusted unit price for ramps, intersections, irregular sections, crossovers, entrances, partially completed units, transitions to ramps, and other areas designated by the Engineer.
- 6.1.2. **Price Adjustments of Deficient Areas.**
 - 6.1.2.1. **Thickness Deficiency \leq 1.0 in.** Table 2 will govern the price adjustment for each unit with deficient areas \leq 1.0 in.

Table 2
Measurements and Price Adjustment for Each Unit

Thickness Deficiency	Additional Measurements	Average Thickness Deficiency of 3 Measurements		Price Adjustment
≤ 0.5 in.	None	N/A		Full Payment
> 0.5 in.	2	≤ 0.5 in.		Full Payment
		> 0.5 in.	≤ 0.8 in.	75% Payment
		> 0.8 in.	≤ 1.0 in.	50% Payment
		> 1.0 in.		In accordance with Section 276.6.1.2.2., "Thickness Deficiency ≥ 1.0 in."

6.1.2.2. **Thickness Deficiency ≥ 1.0 in.** Remove and replace areas of treated base found deficient in thickness by more than 1.0 in., unless otherwise approved. Take exploratory measurements at 50-ft. intervals parallel to the centerline in each direction from the deficient measurement until a measurement is not deficient by more than 1.0 in. The minimum limit of non-pay will be 100 ft.

6.2. **Excess Thickness and Width.** For cubic yard in final position and square yard measurement, no additional payment will be made for thickness or width exceeding that shown on the plans.

Item 292

Asphalt Treatment (Plant-Mixed)



1. DESCRIPTION

Construct a base or foundation course composed of a compacted mixture of aggregate and asphalt binder mixed hot in a mixing plant.

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. When a source change occurs, the Engineer will verify that the specification requirements are met and may require a new laboratory mixture design. Use [Tex-100-E](#) for material definitions.

- 2.1. **Aggregate.** Furnish aggregates that conform to the requirements shown in Table 1 and specified in this Section unless otherwise shown on the plans. Each source must meet the requirements of Table 1. Stockpile aggregates for each source and type separately. Do not add material to an approved stockpile unless approved by the Engineer. The Engineer may allow testing of the proposed combined aggregates, rather than each source, to meet Table 1 requirements.

Table 1
Aggregate Quality Requirements

Property	Test Method	Specification Requirement
Wet ball mill, % Max	Tex-116-E	50
Max increase, % passing #40		20
Los Angeles abrasion, ¹ % Max	Tex-410-A	50
Liquid limit, Max	Tex-104-E	40
Plasticity index, Max	Tex-106-E	10
Sand equivalent, % Min	Tex-203-F	40
Decantation, ² % Max	Tex-406-A	5.0
Crushed faces, % Min	Tex-460-A	60

1. Use only when shown on the plans, instead of wet ball mill test.
2. Required only for reclaimed asphalt pavement (RAP) stockpiles and recycled aggregates when more than 30% RAP is allowed.

- 2.2. **Recycled Materials.** Use of RAP and RAS is permitted unless otherwise shown on the plans. Do not exceed the maximum allowable percentages of RAP and RAS shown in Table 2. Determine asphalt content and gradation of the RAP and RAS stockpiles for mixture design purposes in accordance with [Tex-236-F](#). The Engineer may verify the asphalt content of the stockpiles at any time during production. Perform other tests on RAP and RAS when shown on the plans. Asphalt binder from RAP and RAS is designated as recycled asphalt binder. When RAP or RAS is used, calculate and ensure that the ratio of the recycled asphalt binder to total binder does not exceed the percentages shown in Table 2 during mixture design and production. During production, use a separate cold feed bin for each stockpile of RAP and RAS.

- 2.2.1. **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.

Use of Contractor-owned RAP including HMA plant waste is permitted unless otherwise shown on the plans. Department-owned RAP stockpiles are available for the Contractor's use when the stockpile locations are shown on the plans. If Department-owned RAP is available for the Contractor's use, the Contractor may use Contractor-owned fractionated RAP and replace it with an equal quantity of Department-owned RAP.

Department-owned RAP generated through required work on the Contract is available for the Contractor's use when shown on the plans. Perform any necessary tests to ensure Contractor- or Department-owned RAP is appropriate for use. The Department will not perform any tests or assume any liability for the quality of the Department-owned RAP unless otherwise shown on the plans. The Contractor will retain ownership of RAP generated on the project when shown on the plans.

Fractionated RAP is defined as having 2 or more RAP stockpiles, divided into coarse and fine fractions. The coarse RAP stockpile will contain only material retained by processing over a 3/8 in. screen or 1/2 in. screen unless otherwise approved. The fine RAP stockpile will contain only material passing the 3/8 in. screen or 1/2 in. screen unless otherwise approved. The Engineer may allow the Contractor to use an alternate to the 3/8 in. screen or 1/2 in. screen to fractionate the RAP. The maximum percentages of fractionated RAP may be comprised of coarse or fine fractionated RAP or the combination of both coarse and fine fractionated RAP.

Do not use Department- or Contractor-owned RAP contaminated with dirt or other objectionable materials. Do not use Department- or Contractor-owned RAP if the decantation value exceeds 5% and the plasticity index is greater than 8. Test the stockpiled RAP for decantation in accordance with [Tex-406-A](#), Part I. Determine the plasticity index in accordance with [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 or ignition.

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.

2.2.2.

RAS. Use of post-manufactured RAS or post-consumer RAS (tear-offs) is permitted unless otherwise shown on the plans. RAS is defined as processed asphalt shingle material from manufacturing of asphalt roofing shingles or from re-roofing residential structures. Post-manufactured RAS is processed manufacturer's shingle scrap by-product. Post-consumer RAS is processed shingle scrap removed from residential structures. Comply with all regulatory requirements stipulated for RAS by the TCEQ. RAS may be used separately or in conjunction with RAP.

Process the RAS by ambient grinding or granulating such that 100% of the particles pass the 3/8 in. sieve when tested in accordance with [Tex-200-F](#), Part I. Perform a sieve analysis on processed RAS material before extraction (or ignition) of the asphalt.

Add sand meeting the requirements of Table 3 and having a maximum linear shrinkage of 3.0% when tested in accordance with [Tex-107-E](#), or fine RAP, to RAS stockpiles if needed to keep the processed material workable. For any stockpile that contains RAS, the entire stockpile will be considered a RAS stockpile and be limited to no more than 3.0% of the mixture in accordance with Table 2.

Certify compliance of the RAS with [DMS-11000](#), "Evaluating and Using Nonhazardous Recyclable Materials (NRM) Guidelines." If the RAS has not come into contact with any hazardous materials, treat it as an established NRM. Use RAS from shingle sources on the Department's MPL. Before use, remove substantially all materials that are not part of the shingle, such as wood, paper, metal, plastic, and felt paper. Determine the deleterious content of RAS material for mixture design purposes in accordance with [Tex-217-F](#), Part III. Do not use RAS if deleterious materials are more than 0.5% of the stockpiled RAS unless otherwise approved. Submit a sample for approval to the Engineer before submitting the mixture design. The Department will perform the testing for deleterious material of RAS to determine specification compliance.

Table 2
Maximum Allowable Amounts of Recycled Binder, RAP, and RAS

Mixture Description & Location	Maximum Ratio of Recycled Binder to Total Binder ¹ (%)	Maximum Allowable Recycled Material (%)		
		Unfractionated RAP ²	Fractionated RAP ³	RAS ⁴
Non-Surface	40.0	20.0	30.0	3.0

1. Combined recycled binder from fractionated RAP and RAS.
2. Do not use in combination with RAS or Fractionated RAP.
3. May replace up to 3.0% fractionated RAP with RAS.
4. May be used separately or as a replacement for no more than 3.0% of the allowable fractionated RAP.

Table 3
Gradation Requirements for Fine Aggregate

Sieve Size	% Passing by Weight or Volume
3/8"	100
#8	70–100
#200	0–30

- 2.3. **Asphalt Material.** Furnish PG64-22 asphalt binder that meets requirements of Item 300, "Asphalts, Oils and Emulsions." When more than 30% RAP is allowed and used, ensure that the new binder and recovered binder from the RAP, when blended proportionally, meet the PG64-22 requirements.

- 2.4. **Tack Coat.** Unless otherwise shown on the plans or as 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 one sample of the tack coat binder per project and test to verify compliance with Item 300, "Asphalts, Oils, and Emulsions." The Engineer will obtain the sample from the asphalt distributor immediately before use.

- 2.5. **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 mix may be allowed when approved.

If lime or a liquid antistripping agent is used, add in accordance with Item 301, "Asphalt Antistripping 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 baghouse or dust collection system that reintroduces the fines back into the drum.

3. EQUIPMENT

Provide machinery, tools, and equipment in accordance with Item 320, "Equipment for Asphalt Concrete Pavement."

4. CONSTRUCTION

Produce, haul, place, and compact the specified mixture in accordance with the requirements of this Item.

- 4.1. **Mixture Design.** Using [Tex-126-E](#) and the materials proposed for the project, the Engineer will determine the target asphalt content required to produce a mixture meeting the requirements in Table 4 for the grade shown on the plans. The gradation of the combined aggregates will be determined in accordance with [Tex-200-F](#), Part I. Reimburse the Department for subsequent mixture designs or partial designs necessitated by changes in the material or requests by the Contractor. The Engineer may accept a design from the

Contractor that is performed in accordance with [Tex-126-E](#) and is submitted on the Department-provided template. Obtain mixture design verification and approval before beginning production.

Table 4
Mix Requirements

Master Gradation Bands Tex-200-F, Part I, % Passing by Weight				
Sieve Size	Grade 1	Grade 2	Grade 3	Grade 4
1-3/4"		100	100	As shown on the plans
1-1/2"	100	90-100		
1"	90-100			
3/8"	45-70			
#4	30-55	25-55		
#40	15-30	15-40	15-40	
Asphalt Content, Min(Tex-236-F)				
	4.0%	4.0%	4.0%	4.0%
Strength Requirements (Tex-226-F)				
Indirect tensile strength, (dry) psi ¹	85-200	85-200	85-200	85-200

1. At optimum asphalt content.

The Engineer will evaluate the mixture for moisture susceptibility in accordance with [Tex-530-C](#) unless otherwise shown on the plans. A maximum of 10% stripping is allowed unless otherwise shown on the plans. The test sample will be retained and used to establish a baseline for comparison to production results. The Engineer may waive this test if a similar design using the same materials has proven satisfactory.

Produce a trial batch using the proposed project equipment and materials in a large enough quantity to ensure that the mixture is representative of the mixture design. Within one full working day, the Engineer will sample and test the trial batch to ensure that the gradation, asphalt content and strength requirements in Table 4 are met. The Engineer may waive trial mixtures if similar designs have proven satisfactory.

- 4.2. **Production Operations.** Produce a new trial batch when the plant or plant location is changed. Take corrective action and receive approval to proceed after any production suspension for non-compliance to the specification.
- 4.2.1. **Storage and Heating of Materials.** Do not heat the asphalt binder above the temperature 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 hot-mix for more than 12 hr. or for a time period less than 12 hr. that affects the quality of the mixture.
- 4.2.2. **Mixing and Discharge of Materials.** Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. When ordinary compaction is used, the Engineer will select a target discharge temperature between 225°F and 350°F. 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. The Engineer may perform [Tex-212-F, Part II](#), to verify that the mixture contains no more than 0.2% moisture by weight. The sample will be taken immediately after the mixture is discharged into the truck and tested promptly.

- 4.3. **Hauling Operations.** Before use, clean all truck beds to ensure that the mixture will not become contaminated. When a release agent is necessary, use a release agent on the Department's MPL to coat the truck bed.
- 4.4. **Placement Operations.** Prepare the surface by removing objectionable material such as moisture, dirt, sand, leaves and other loose impediments before placing the mixture. Coordinate mixture delivery and paver speed to ensure a continuous placement operation. Suspend placement operations when, in the opinion of

the Engineer, a continuous paving operation is not maintained. Place the mixture to produce a smooth, finished surface with a uniform appearance and texture that meet typical section requirements. Offset longitudinal joints of successive courses of stabilized base by at least 6 in. Place the mix adjacent to gutters and structures so that the pavement will drain properly.

4.4.1. **Weather Conditions.** Tack coat and mixture may be placed only when the roadway surface temperature is 60°F or higher unless otherwise approved. Measure the roadway surface temperature with a handheld infrared thermometer. Place tack coat or mixtures only when the Engineer determines that general weather conditions and moisture conditions of the roadway surface are suitable. The Engineer may waive placement temperature requirements.

4.4.2. **Tack Coat.** Clean the surface before placing the tack coat. Unless otherwise approved, apply tack coat uniformly at a 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 joints. Prevent splattering of tack coat when placed adjacent to curbs, gutters, and structures. Roll the tack coat with a pneumatic tire roller unless otherwise 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. The Engineer may waive the requirement to place tack coat.

4.4.3. **Lay-Down Operations.** Dump and spread the asphalt mixture on the approved prepared surface with a spreading and finishing machine. Place the material without tearing, shoving, gouging, or segregating the mixture.

Do not jar or bounce the finishing machine when loading it. Obtain the required lines and grades without hand finishing. The Engineer may authorize hand finishing when the mixture is:

- placed in a narrow strip along the edge of existing pavement,
- used to level small areas, or
- placed in small irregular areas where the use of a finishing machine is not practical.

Leveling courses and other areas may be spread with a motor grader when shown on the plans or approved.

When hot-mix is placed in windrows, operate windrow pick-up equipment so that substantially all the mixture deposited on the roadbed is picked up and loaded into the spreading and finishing machine.

Adjust the hopper flow gates of the spreading and finishing machine to provide an adequate and consistent flow of material. Operate the augers at least 85% of the time. Keep the augers one-half to three-quarters full of mixture. Maintain an adequate flow of material to the center of the paver for the full width of the mat.

Immediately take appropriate corrective action if surface irregularities including but not limited to segregation, rutting, raveling, flushing, fat spots, mat slippage, color, texture, roller marks, tears, gouges, or streaks are detected. Continue placement for no more than one day of production while appropriate action is taken. If no appropriate corrective action is taken or if the problem still exists after one day, suspend paving until the Engineer approves further production.

4.5. **Compaction.** Uniformly compact the pavement to the density requirements of this Item. Use the procedure described in [Tex-207-F](#), Part IV, to establish the rolling pattern. Do not use pneumatic tire rollers if excessive pickup of fines by roller tires occurs.

When using three-wheel, tandem, or vibratory rollers, first roll the joint with the adjacent pavement. Continue rolling longitudinally at the sides, proceeding toward the center of the pavement, and overlap successive trips by at least one foot unless otherwise directed. Make alternate trips of the roller slightly different in length. Begin rolling of superelevated curves at the low side and proceed toward the high side unless otherwise directed.

When operating vibratory rollers:

- do not operate in vibrating mode when stationary;

- do not operate in vibrating mode when changing directions;
- do not operate in vibrating mode on mats with a plan depth of less than 1-1/2 in.;
- do not allow the roller to stand on pavement that has not been fully compacted;
- do not operate when in contact with the compacted, finished pavement structure layer;
- in case of over-vibration resulting in disruption of the compacted material, rework and recompact or replace the damaged material at the Contractor's expense;
- roll at a speed producing at least 10 blows per foot unless otherwise directed;
- keep the drums moist with water without using excess water; and
- do not drop diesel, gasoline, oil, grease, or other foreign matter on the pavement.

Where specific air void requirements are waived, furnish and operate compaction equipment as approved. Use lightly oiled tamps to thoroughly compact the edges of the pavement along curbs, headers, and similar structures and in locations that will not permit thorough compaction with rollers. The Engineer may require rolling with a trench roller on widened areas, in trenches, and in other limited areas.

In-place compaction control is required for all mixtures. Complete all rolling for compaction before the mixture temperature drops below 175°F. Unless otherwise shown on the plans, use density control.

- 4.5.1. **Density Control.** Determine the number and type of rollers needed to obtain the required density. Operate the rollers in accordance with the requirements of this specification and as approved.

Place and compact material to a minimum of 97.0% density as determined by [Tex-126-E](#) or as shown on the plans. The Engineer will determine laboratory-molded density in accordance with [Tex-126-E](#) from material sampled at the plant. Actual in-place density will be determined in accordance with [Tex-126-E](#) unless otherwise directed. Unless otherwise shown on the plans, obtain required roadway specimens as directed. The Engineer will measure air voids in accordance with [Tex-207-F](#). When a satisfactory correlation to results obtained in accordance with [Tex-126-E](#) is shown, other methods of determining in-place compaction may be used.

If in-place density is more than 1.0% below minimum density, cease production immediately. If in-place density is between 0.1% and 1.0% below minimum density, investigate the causes and make the necessary corrections. If minimum density is not obtained within one full day of operation, cease production.

Resume production after placing a test section of one lane width and a maximum 0.2 miles long that demonstrates that minimum density can be obtained. Repeat this procedure until producing a test section that meets minimum density requirements. Place no more than 2 test sections per day. Increasing the asphalt content of the mixture to increase in-place density is allowed by approval only.

- 4.5.2. **Ordinary Compaction.** Furnish the type, size and number of rollers required for compaction, as approved or directed. Use at least one pneumatic tire roller. Pneumatic tire rollers will provide a minimum of 80 psi ground contact pressure when used for compaction and a minimum of 55 psi ground contact pressure when used for kneading and sealing the surface.

Establish rolling patterns in accordance with [Tex-207-F](#), Part IV, unless otherwise directed. Follow the selected rolling pattern unless changes in mixture or placement conditions that affect compaction occur. When changes occur, establish a new rolling pattern.

- 4.6. **Sampling and Testing.**

- 4.6.1. **Production Sampling.**

- 4.6.1.1. **Mixture Sampling.** The Engineer will obtain mixture samples in accordance with [Tex-222-F](#).

- 4.6.1.2. **Asphalt Binder Sampling.** The Engineer will obtain at least one 1-quart sample of the asphalt binder used during the project, labeled with date and time, sampled from a port located immediately upstream from the mixing drum or pug mill. The sample will be taken in accordance with [Tex-500-C](#), Part II.
- 4.6.2. **Production Testing.** The Engineer will perform production tests.
- 4.6.2.1. **Operational Tolerances.** The Engineer will determine compliance with operational tolerances. The gradation of the aggregate must be within the master grading limits for the specified grade except that a tolerance of 2% is allowed on the sieve size for each mixture grade that shows 100% passing in Table 2.
- Ensure that the asphalt content does not vary by more than 0.5% from the design target.
- 4.6.2.2. **Individual Loads of Asphalt-Stabilized Base.** The Engineer retains the right to reject individual truckloads of asphalt-stabilized base when it is evident that the material quality is unacceptable. When a load is rejected for reasons other than temperature, the Contractor may request that the rejected load be tested. Make this request within 4 hours of rejection. If Department test results are within the operational tolerances listed in Section 292.4.6.2.1., "Operational Tolerances," payment will be made for the load. If Department test results are not within operational tolerances, no payment will be made for the load.
- 4.6.3. **Placement Sampling and Testing.** Obtain two 6-in. diameter cores side by side at locations selected by the Engineer. Provide the Engineer an opportunity to witness the coring operation and measure the core thickness. Mark the cores for identification. Immediately after obtaining the cores, dry the core holes and tack the sides and bottom. Fill the hole with the same type of mixture and properly compact the mixture. Other methods of repairing the core holes are allowed when approved.
- Trim the cores, if necessary, and deliver them to the Engineer within one working day following placement operations unless otherwise approved.
- 4.6.3.1. **In-Place Air Voids.** The Engineer will measure in-place air voids in accordance with [Tex-207-F](#) and [Tex-227-F](#) to verify that in-place density requirements of Section 292.4.5.1., "Density Control," are met.
- 4.6.3.2. **Irregularities.** Remove and replace, at the expense of the Contractor and to the satisfaction of the Engineer, any mixture that does not bond to the existing pavement or has other surface irregularities identified by the Engineer.
- 4.6.3.3. **Production Binder Properties.** The Engineer may take cores or other production samples at random from the project to determine recovered asphalt properties. Asphalt binders with an aging ratio greater than 3.5 do not meet requirements for recovered asphalt properties and may be deemed defective when tested and evaluated by the Construction Division. The aging ratio, as determined in accordance with AASHTO T 315, is the DSR value of the extracted binder divided by the DSR value of the original unaged binder. The binder from RAP will be included proportionally as part of the original unaged binder. The Engineer may require the defective material be removed and replaced at the Contractor's expense. The asphalt binder will be recovered for testing from cores in accordance with [Tex-211-F](#).
- 4.7. **Surface Finish.** Use Surface Test Type A in accordance with Item 585, "Ride Quality for Pavement Surfaces," unless otherwise shown on the plans.
- 4.8. **Opening to Traffic.** Open the completed course to traffic when permitted or directed. If the surface ravels, flushes, ruts, or deteriorates in any manner before final acceptance, correct it at the Contractor's expense and to the satisfaction of the Engineer.

5. MEASUREMENT

Asphalt-treated base will be measured by the ton as a composite mixture of asphalt, aggregate, RAP, and additives noted on the plans and approved. Measurement will be made using scales meeting the requirements of Item 520, "Weighing and Measuring Equipment."

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Asphalt Stabilized Base" of the grade and binder type specified. This price is full compensation for furnishing and disposing of materials, producing trial batches, loading, hauling, placing, compacting, sampling, testing, replacing defective material, furnishing scales and labor for weighing and measuring, and equipment, labor, tools, and incidentals. State-owned RAP from sources designated on the plans shown to be available will be provided to the Contractor at no cost.

Item 360

Concrete Pavement



1. DESCRIPTION

Construct hydraulic cement concrete pavement with or without curbs on the concrete pavement.

2. MATERIALS

- 2.1. **Hydraulic Cement Concrete.** Provide hydraulic cement concrete in accordance with Item 421, "Hydraulic Cement Concrete." Use compressive strength testing unless otherwise shown on the plans. Provide Class P concrete designed to meet a minimum average compressive strength of 3,200 psi or a minimum average flexural strength of 450 psi at 7 days or a minimum average compressive strength of 4,000 psi or a minimum average flexural strength of 570 psi at 28 days. Test in accordance with [Tex-448-A](#) or [Tex-418-A](#).

Obtain written approval if the concrete mix design exceeds 520 lb. per cubic yard of cementitious material.

Use coarse aggregates for continuously reinforced concrete pavements to produce concrete with a coefficient of thermal expansion not more than 5.5×10^{-6} in./in./°F. Provide satisfactory [Tex-428-A](#) test data from an approved testing laboratory if the coarse aggregate coefficient of thermal expansion listed on the Department's *Concrete Rated Source Quality Catalog* is not equal to or less than 5.5×10^{-6} in./in./°F.

Provide Class HES concrete for very early opening of small pavement areas or leave-outs to traffic when shown on the plans or allowed. Design Class HES to meet the requirements of Class P and a minimum average compressive strength of 3,200 psi or a minimum average flexural strength of 450 psi in 24 hr., unless other early strength and time requirements are shown on the plans or allowed.

Use Class A or P concrete meeting the requirements of Item 421, "Hydraulic Cement Concrete," and this Item for curbs that are placed separately from the pavement.

- 2.2. **Reinforcing Steel.** Provide Grade 60 or above, deformed steel for bar reinforcement in accordance with Item 440, "Reinforcement for Concrete." Provide positioning and supporting devices (baskets and chairs) capable of securing and holding the reinforcing steel in proper position before and during paving. Provide corrosion protection when shown on the plans.
- 2.2.1. **Dowels.** Provide smooth, straight dowels of the size shown on the plans, free of burrs, and conforming to the requirements of Item 440, "Reinforcement for Concrete." Coat dowels with a thin film of grease, wax, silicone or other approved de-bonding material. Provide dowel caps on the lubricated end of each dowel bar used in an expansion joint. Provide dowel caps filled with a soft compressible material with enough range of movement to allow complete closure of the expansion joint.
- 2.2.2. **Tie Bars.** Provide straight deformed steel tie bars. Provide either multiple-piece tie bars or single-piece tie bars as shown on the plans. Furnish multiple piece tie bar assemblies from the list of approved multiple-piece tie bars that have been prequalified in accordance with DMS-4515, "Multiple Piece Tie Bars for Concrete Pavements," when used. Multiple-piece tie bars used on individual projects must be sampled in accordance with [Tex-711-I](#), and tested in accordance with DMS-4515 "Multiple Piece Tie Bars for Concrete Pavements."
- 2.3. **Alternative Reinforcing Materials.** Provide reinforcement materials of the dimensions and with the physical properties specified when allowed or required by the plans. Provide manufacturer's certification of required material properties.

- 2.4. **Curing Materials.** Provide Type 2 membrane curing compound conforming to [DMS-4650](#), "Hydraulic Cement Concrete Curing Materials and Evaporation Retardants." Provide SS-1 emulsified asphalt conforming to Item 300, "Asphalts, Oils, and Emulsions," for concrete pavement to be overlaid with asphalt concrete under this Contract unless otherwise shown on the plans or approved. Provide materials for other methods of curing conforming to the requirements of Item 422, "Concrete Superstructures." Provide insulating blankets for curing fast track concrete pavement with a minimum thermal resistance (R) rating of 0.5 hour-square foot F/BTU. Use insulating blankets that are free from tears and are in good condition.
- 2.5. **Epoxy.** Provide Type III, Class C epoxy in accordance with [DMS-6100](#), "Epoxies and Adhesives," for installing all drilled-in reinforcing steel. Submit a work plan and request approval for the use of epoxy types other than Type III, Class C.
- 2.6. **Evaporation Retardant.** Provide evaporation retardant conforming to [DMS-4650](#), "Hydraulic Cement Concrete Curing Materials and Evaporation Retardants."
- 2.7. **Joint Sealants and Fillers.** Provide Class 5 or Class 8 joint-sealant materials and fillers unless otherwise shown on the plans or approved and other sealant materials of the size, shape, and type shown on the plans in accordance with [DMS-6310](#), "Joint Sealants and Fillers."

3. EQUIPMENT

Furnish and maintain all equipment in good working condition. Use measuring, mixing, and delivery equipment conforming to the requirements of Item 421, "Hydraulic Cement Concrete." Obtain approval for other equipment used.

- 3.1. **Placing, Consolidating, and Finishing Equipment.** Provide approved self-propelled paving equipment that uniformly distributes the concrete with minimal segregation and provides a smooth machine-finished consolidated concrete pavement conforming to plan line and grade. Provide an approved automatic grade control system on slip-forming equipment. Provide approved mechanically-operated finishing floats capable of producing a uniformly smooth pavement surface. Provide equipment capable of providing a fine, light water fog mist.

When string-less paving equipment is used, use Section 5.9.3, "Method C," and establish control points at maximum intervals of 500 ft. Use these control points as reference to perform the work.

Provide mechanically-operated vibratory equipment capable of adequately consolidating the concrete. Provide immersion vibrators on the paving equipment at sufficiently close intervals to provide uniform vibration and consolidation of the concrete over the entire width and depth of the pavement and in accordance with the manufacturer's recommendations. Provide immersion vibrator units that operate at a frequency in air of at least 8,000 cycles per minute. Provide enough hand-operated immersion vibrators for timely and proper consolidation of the concrete along forms, at all joints and in areas not covered by other vibratory equipment. Surface vibrators may be used to supplement equipment-mounted immersion vibrators. Provide tachometers to verify the proper operation of all vibrators.

For small or irregular areas or when approved, the paving equipment described in this Section is not required.

- 3.2. **Forming Equipment.**
- 3.2.1. **Pavement Forms.** Provide metal side forms of sufficient cross-section, strength, and rigidity to support the paving equipment and resist the impact and vibration of the operation without visible springing or settlement. Use forms that are free from detrimental kinks, bends, or warps that could affect ride quality or alignment. Provide flexible or curved metal or wood forms for curves of 100-ft. radius or less.
- 3.2.2. **Curb Forms.** Provide curb forms for separately placed curbs that are not slipformed that conform to the requirements of Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."

- 3.3. **Reinforcing Steel Inserting Equipment.** Provide inserting equipment that accurately inserts and positions reinforcing steel in the plastic concrete parallel to the profile grade and horizontal alignment in accordance to plan details when approved.
- 3.4. **Texturing Equipment.**
- 3.4.1. **Carpet Drag.** Provide a carpet drag mounted on a work bridge or a manual moveable support system. Provide a single piece of carpet of sufficient transverse length to span the full width of the pavement being placed and adjustable so that a sufficient longitudinal length of carpet is in contact with the concrete being placed to produce the desired texture. Obtain approval to vary the length and width of the carpet to accommodate specific applications.
- 3.4.2. **Tining Equipment.** Provide a self-propelled metal tine device equipped with steel tines with cross-section approximately 1/32 in. thick × 1/12 in. wide. Provide tines for transverse tining equipment spaced at approximately 1 in., center-to-center, or provide tines for longitudinal tining equipment spaced at approximately 3/4 in., center-to-center. Manual methods that produce an equivalent texture may be used when it is impractical to use self-propelled equipment, such as for small areas, narrow width sections, and in emergencies due to equipment breakdown.
- 3.5. **Curing Equipment.** Provide a self-propelled machine for applying membrane curing compound using mechanically-pressurized spraying equipment with atomizing nozzles. Provide equipment and controls that maintain the required uniform rate of application over the entire paving area. Provide curing equipment that is independent of all other equipment when required to meet the requirements of Section 360.4.9., "Curing." Hand-operated pressurized spraying equipment with atomizing nozzles may only be used on small or irregular areas, narrow width sections, or in emergencies due to equipment breakdown.
- 3.6. **Sawing Equipment.** Provide power-driven concrete saws to saw the joints shown on the plans. Provide standby power-driven concrete saws during concrete sawing operations.
- 3.7. **Grinding Equipment.** Provide self-propelled powered grinding equipment that is specifically designed to smooth and texture concrete pavement using circular diamond blades when required. Provide equipment with automatic grade control capable of grinding at least a 3-ft. width longitudinally in each pass without damaging the concrete.
- 3.8. **Testing Equipment.** Provide testing equipment regardless of job-control testing responsibilities in accordance with Item 421, "Hydraulic Cement Concrete," unless otherwise shown on the plans or specified.
- 3.9. **Coring Equipment.** Provide coring equipment capable of extracting cores in accordance with the requirements of [Tex-424-A](#) when required.
- 3.10. **Miscellaneous Equipment.** Furnish both 10-ft. and 15-ft. steel or magnesium long-handled, standard straightedges. Furnish enough work bridges, long enough to span the pavement, for finishing and inspection operations.

4. CONSTRUCTION

Obtain approval for adjustments to plan grade-line to maintain thickness over minor subgrade or base high spots while maintaining clearances and drainage. Maintain subgrade or base in a smooth, clean, compacted condition in conformity with the required section and established grade until the pavement concrete is placed. Keep subgrade or base damp with water before placing pavement concrete.

Adequately light the active work areas for all nighttime operations. Provide and maintain tools and materials to perform testing.

- 4.1. **Paving and Quality Control Plan.** Submit a paving and quality control plan for approval before beginning pavement construction operations. Include details of all operations in the concrete paving process, including

methods to construct transverse joints, methods to consolidate concrete at joints, longitudinal construction joint layout, sequencing, curing, lighting, early opening, leave-outs, sawing, inspection, testing, construction methods, other details and description of all equipment. List certified personnel performing the testing. Submit revisions to the paving and quality control plan for approval.

- 4.2. **Job-Control Testing.** Perform all fresh and hardened concrete job-control testing at the specified frequency unless otherwise shown on the plans. Provide job-control testing personnel meeting the requirements of Item 421, "Hydraulic Cement Concrete." Provide and maintain testing equipment, including strength testing equipment at a location acceptable to the Engineer. Use of a commercial laboratory is acceptable. Maintain all testing equipment calibrated in accordance with pertinent test methods. Make strength-testing equipment available to the Engineer for verification testing.

Provide the Engineer the opportunity to witness all tests. The Engineer may require a retest if not given the opportunity to witness. Furnish a copy of all test results to the Engineer daily. Check the first few concrete loads for slump and temperature to verify concrete conformance and consistency on start-up production days. Sample and prepare strength-test specimens (2 specimens per test) on the first day of production and for each 3,000 sq. yd. or fraction thereof of concrete pavement thereafter. Prepare at least 1 set of strength-test specimens for each production day. Perform slump and temperature tests each time strength specimens are made. Monitor concrete temperature to ensure that concrete is consistently within the temperature requirements. The Engineer will direct random job-control sampling and testing. Immediately investigate and take corrective action as approved if any Contractor test result, including tests performed for verification purposes, does not meet specification requirements.

The Engineer will perform job-control testing when the testing by the Contractor is waived by the plans; however, this does not waive the Contractor's responsibility for providing materials and work in accordance with this Item.

- 4.2.1. **Job-Control Strength.** Use 7-day job-control concrete strength testing in accordance with [Tex-448-A](#) or [Tex-418-A](#) unless otherwise shown on the plans or permitted.

Use a compressive strength of 3,200 psi or a lower job-control strength value proven to meet a 28-day compressive strength of 4,000 psi as correlated in accordance with [Tex-427-A](#) for 7-day job-control by compressive strength. Use a flexural strength of 450 psi or a lower job-control strength value proven to meet a 28-day flexural strength of 570 psi as correlated in accordance with [Tex-427-A](#) for 7-day job-control by flexural strength.

Job control of concrete strength may be correlated to an age other than 7 days in accordance with [Tex-427-A](#) when approved. Job-control strength of Class HES concrete is based on the required strength and time.

Investigate the strength test procedures, the quality of materials, the concrete production operations, and other possible problem areas to determine the cause when a job-control concrete strength test value is more than 10% below the required job-control strength or when 3 consecutive job-control strength values fall below the required job-control strength. Take necessary action to correct the problem, including redesign of the concrete mix if needed. The Engineer may suspend concrete paving if the Contractor is unable to identify, document, and correct the cause of low-strength test values in a timely manner. The Engineer will evaluate the structural adequacy of the pavements if any job-control strength is more than 15% below the required job-control strength. Remove and replace pavements found to be structurally inadequate at no additional cost when directed.

- 4.2.2. **Split-Sample Verification Testing.** Perform split-sample verification testing with the Engineer on random samples taken and split by the Engineer at a rate of at least 1 for every 10 job-control samples. The Engineer will evaluate the results of split-sample verification testing. Immediately investigate and take corrective action as approved when results of split-sample verification testing differ more than the allowable differences shown in Table 1, or the average of 10 job-control strength results and the Engineer's split-sample strength result differ by more than 10%.

Table 1
Verification Testing Limits

Test Method	Allowable Differences
Temperature, Tex-422-A	2°F
Flexural strength, Tex-448-A	19%
Compressive strength, Tex-418-A	10%

- 4.3. **Reinforcing Steel and Joint Assemblies.** Accurately place and secure in position all reinforcing steel as shown on the plans. Place dowels at mid-depth of the pavement slab, parallel to the surface. Place dowels for transverse contraction joints parallel to the pavement edge. Tolerances for location and alignment of dowels will be shown on the plans. Stagger the lap locations so that no more than 1/3 of the longitudinal steel is spliced in any given 12-ft. width and 2-ft. length of the pavement. Use multiple-piece tie bars, drill and epoxy grout tie bars, or, if approved, mechanically-inserted single-piece tie bars at longitudinal construction joints. Verify that tie bars that are drilled and epoxied or mechanically inserted into concrete at longitudinal construction joints develop a pullout resistance equal to a minimum of 3/4 of the yield strength of the steel after 7 days. Test 15 bars using ASTM E488, except that alternate approved equipment may be used. All 15 tested bars must meet the required pullout strength. Perform corrective measures to provide equivalent pullout resistance if any of the test results do not meet the required minimum pullout strength. Repair damage from testing. Acceptable corrective measures include but are not limited to installation of additional or longer tie bars.
- 4.3.1. **Manual Placement.** Secure reinforcing bars at alternate intersections with wire ties or locking support chairs. Tie all splices with wire.
- 4.3.2. **Mechanical Placement.** Complete the work using manual placement methods described above if mechanical placement of reinforcement results in steel misalignment or improper location, poor concrete consolidation, or other inadequacies.
- 4.4. **Joints.** Install joints as shown on the plans. Joint sealants are not required on concrete pavement that is to be overlaid with asphaltic materials. Clean and seal joints in accordance with Item 438, "Cleaning and Sealing Joints." Repair excessive spalling of the joint saw groove using an approved method before installing the sealant. Seal all joints before opening the pavement to all traffic. Install a rigid transverse bulkhead, for the reinforcing steel, and shaped accurately to the cross-section of the pavement when placing of concrete is stopped.
- 4.4.1. **Placing Reinforcement at Joints.** Complete and place the assembly of parts at pavement joints at the required location and elevation, with all parts rigidly secured in the required position, when shown on the plans.
- 4.4.2. **Transverse Construction Joints.**
- 4.4.2.1. **Continuously Reinforced Concrete Pavement (CRCP).** Install additional longitudinal reinforcement through the bulkhead when shown on the plans. Protect the reinforcing steel immediately beyond the construction joint from damage, vibration, and impact.
- 4.4.2.2. **Concrete Pavement Contraction Design (CPCD).** Install and rigidly secure a complete joint assembly and bulkhead in the planned transverse contraction joint location when the placing of concrete is intentionally stopped. Install a transverse construction joint either at a planned transverse contraction joint location or mid-slab between planned transverse contraction joints when the placing of concrete is unintentionally stopped. Install tie bars of the size and spacing used in the longitudinal joints for mid-slab construction joints.
- 4.4.2.3. **Curb Joints.** Provide joints in the curb of the same type and location as the adjacent pavement. Use expansion joint material of the same thickness, type, and quality required for the pavement and of the section shown for the curb. Extend expansion joints through the curb. Construct curb joints at all transverse pavement joints. Place reinforcing steel into the plastic concrete pavement for non-monolithic curbs as shown on the plans unless otherwise approved. Form or saw the weakened plane joint across the full width

of concrete pavement and through the monolithic curbs. Construct curb joints in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."

- 4.5. **Placing and Removing Forms.** Use clean and oiled forms. Secure forms on a base or firm subgrade that is accurately graded and that provides stable support without deflection and movement by form riding equipment. Pin every form at least at the middle and near each end. Tightly join and key form sections together to prevent relative displacement.

Set side forms far enough in advance of concrete placement to permit inspection. Check conformity of the grade, alignment, and stability of forms immediately before placing concrete, and make all necessary corrections. Use a straightedge or other approved method to test the top of forms to ensure that the ride quality requirements for the completed pavement will be met. Stop paving operations if forms settle or deflect more than 1/8 in. under finishing operations. Reset forms to line and grade, and refinish the concrete surface to correct grade.

Avoid damage to the edge of the pavement when removing forms. Repair damage resulting from form removal and honeycombed areas with a mortar mix within 24 hr. after form removal unless otherwise approved. Clean joint face and repair honeycombed or damaged areas within 24 hr. after a bulkhead for a transverse construction joint has been removed unless otherwise approved. Promptly apply membrane curing compound to the edge of the concrete pavement when forms are removed before 72 hr. after concrete placement.

Forms that are not the same depth as the pavement, but are within 2 in. of that depth are permitted if the subbase is trenched or the full width and length of the form base is supported with a firm material to produce the required pavement thickness. Promptly repair the form trench after use. Use flexible or curved wood or metal forms for curves of 100-ft. radius or less.

- 4.6. **Concrete Delivery.** Clean delivery equipment as necessary to prevent accumulation of old concrete before loading fresh concrete. Use agitated delivery equipment for concrete designed to have a slump of more than 5 in. Segregated concrete is subject to rejection.

Begin the discharge of concrete delivered in agitated delivery equipment conforming to the requirements of Item 421, "Hydraulic Cement Concrete." Place non-agitated concrete within 45 min. after batching. Reduce times as directed when hot weather or other conditions cause quick setting of the concrete.

- 4.7. **Concrete Placement.** Do not allow the pavement edge to deviate from the established paving line by more than 1/2 in. at any point. Place the concrete as near as possible to its final location, and minimize segregation and rehandling. Distribute concrete using shovels where hand spreading is necessary. Do not use rakes or vibrators to distribute concrete.

- 4.7.1. **Consolidation.** Consolidate all concrete by approved mechanical vibrators operated on the front of the paving equipment. Use immersion-type vibrators that simultaneously consolidate the full width of the placement when machine finishing. Keep vibrators from dislodging reinforcement. Use hand-operated vibrators to consolidate concrete along forms, at all joints and in areas not accessible to the machine-mounted vibrators. Do not operate machine-mounted vibrators while the paving equipment is stationary. Vibrator operations are subject to review.

- 4.7.2. **Curbs.** Conform to the requirements of Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter" where curbs are placed separately.

- 4.7.3. **Temperature Restrictions.** Place concrete that is between 40°F and 95°F when measured in accordance with [Tex-422-A](#) at the time of discharge, except that concrete may be used if it was already in transit when the temperature was found to exceed the allowable maximum. Take immediate corrective action or cease concrete production when the concrete temperature exceeds 95°F.

Do not place concrete when the ambient temperature in the shade is below 40°F and falling unless approved. Concrete may be placed when the ambient temperature in the shade is above 35°F and rising or

above 40°F. Protect the pavement with an approved insulating material capable of protecting the concrete for the specified curing period when temperatures warrant protection against freezing. Submit for approval proposed measures to protect the concrete from anticipated freezing weather for the first 72 hr. after placement. Repair or replace all concrete damaged by freezing.

- 4.8. **Spreading and Finishing.** Finish all concrete pavement with approved self-propelled equipment. Use power-driven spreaders, power-driven vibrators, power-driven strike-off, screed, or approved alternate equipment. Use the transverse finishing equipment to compact and strike-off the concrete to the required section and grade without surface voids. Use float equipment for final finishing. Use concrete with a consistency that allows completion of all finishing operations without addition of water to the surface. Use the minimal amount of water fog mist necessary to maintain a moist surface. Reduce fogging if float or straightedge operations result in excess slurry.
- 4.8.1. **Finished Surface.** Perform sufficient checks with long-handled 10-ft. and 15-ft. straightedges on the plastic concrete to ensure the final surface is within the tolerances specified in Surface Test A in Item 585, "Ride Quality for Pavement Surfaces." Check with the straightedge parallel to the centerline.
- 4.8.2. **Maintenance of Surface Moisture.** Prevent surface drying of the pavement before application of the curing system by means that may include water fogging, the use of wind screens, and the use of evaporation retardants. Apply evaporation retardant at the manufacturer's recommended rate. Reapply the evaporation retardant as needed to maintain the concrete surface in a moist condition until curing system is applied. Do not use evaporation retardant as a finishing aid. Failure to take acceptable precautions to prevent surface drying of the pavement will be cause for shutdown of pavement operations.
- 4.8.3. **Surface Texturing.** Complete final texturing before the concrete has attained its initial set. Drag the carpet longitudinally along the pavement surface with the carpet contact surface area adjusted to provide a satisfactory coarsely textured surface. Prevent the carpet from getting plugged with grout. Do not perform carpet dragging operations while there is excessive bleed water.

A metal-tine texture finish is required unless otherwise shown on the plans. Provide transverse tining unless otherwise shown on the plans. Immediately following the carpet drag, apply a single coat of evaporation retardant, if needed, at the rate recommended by the manufacturer. Provide the metal-tine finish immediately after the concrete surface has set enough for consistent tining. Operate the metal-tine device to obtain grooves approximately 3/16 in. deep, with a minimum depth of 1/8 in., and approximately 1/12 in. wide. Do not overlap a previously tined area. Use manual methods to achieve similar results on ramps, small or irregular areas, and narrow width sections of pavements. Repair damage to the edge of the slab and joints immediately after texturing. Do not tine pavement that will be overlaid or that is scheduled for blanket diamond grinding or shot blasting.

Target a carpet drag texture of 0.04 in., as measured by [Tex-436-A](#), when carpet drag is the only surface texture required on the plans. Ensure adequate and consistent macro-texture is achieved by applying enough weight to the carpet and by keeping the carpet from getting plugged with grout. Correct any location with a texture less than 0.03 in. by diamond grinding or shot blasting. The Engineer will determine the test locations at points located transversely to the direction of traffic in the outside wheel path.

- 4.8.4. **Small, Irregular Area, or Narrow Width Placements.** Use hand equipment and procedures that produce a consolidated and finished pavement section to the line and grade where machine placements and finishing of concrete pavement are not practical.
- 4.8.5. **Emergency Procedures.** Use hand-operated equipment for applying texture, evaporation retardant, and cure in the event of equipment breakdown.
- 4.9. **Curing.** Keep the concrete pavement surface from drying as described in Section 360.4.8.2., "Maintenance of Surface Moisture," until the curing material has been applied. Maintain and promptly repair damage to curing materials on exposed surfaces of concrete pavement continuously for at least 3 curing days. A curing day is defined as a 24-hr. period when either the temperature taken in the shade away from artificial heat is above 50°F for at least 19 hr. or the surface temperature of the concrete is maintained above 40°F for 24 hr.

Curing begins when the concrete curing system has been applied. Stop concrete paving if curing compound is not being applied promptly and maintained adequately. Other methods of curing in accordance with Item 422, "Concrete Superstructures," may be used when specified or approved.

- 4.9.1. **Membrane Curing.** Spray the concrete surface uniformly with 2 coats of membrane curing compound at an individual application rate of no more than 180 sq. ft. per gallon. Apply the curing compound before allowing the concrete surface to dry.

Manage finishing and texturing operations to ensure placement of curing compound on a moist concrete surface, relatively free of bleed water, to prevent any plastic shrinkage cracking. Time the application of curing compound to prevent plastic shrinkage cracking.

Maintain curing compounds in a uniformly agitated condition, free of settlement before and during application. Do not thin or dilute the curing compound.

Apply additional compound at the same rate of coverage to correct damage where the coating shows discontinuities or other defects or if rain falls on the newly coated surface before the film has dried enough to resist damage. Ensure that the curing compound coats the sides of the tining grooves.

- 4.9.2. **Asphalt Curing.** Apply a uniform coating of asphalt curing at a rate of 90 to 180 sq. ft. per gallon when an asphaltic concrete overlay is required. Apply curing immediately after texturing and once the free moisture (sheen) has disappeared. Obtain approval to add water to the emulsion to improve spray distribution. Maintain the asphalt application rate when using diluted emulsions. Maintain the emulsion in a mixed condition during application.

- 4.9.3. **Curing Class HES Concrete.** Provide membrane curing in accordance with Section 360.4.9.1., "Membrane Curing," for all Class HES concrete pavement. Promptly follow by wet mat curing in accordance with Section 422.4.8., "Final Curing," until opening strength is achieved but not less than 24 hr.

- 4.9.4. **Curing Fast-Track Concrete Pavement.** Provide wet mat curing unless otherwise shown on the plans or as directed. Cure in accordance with Section 422.4.8., "Final Curing." Apply a Type 1-D or Type 2 membrane cure instead of wet mat curing if the air temperature is below 65°F and insulating blankets are used.

- 4.10. **Sawing Joints.** Saw joints to the depth shown on the plans as soon as sawing can be accomplished without damage to the pavement regardless of time of day or weather conditions. Some minor raveling of the saw-cut is acceptable. Use a chalk line, string line, sawing template, or other approved method to provide a true joint alignment. Provide enough saws to match the paving production rate to ensure sawing completion at the earliest possible time to avoid uncontrolled cracking. Reduce paving production if necessary to ensure timely sawing of joints. Promptly restore membrane cure damaged within the first 72 hr. of curing.

- 4.11. **Protection of Pavement and Opening to Traffic.** Testing for early opening is the responsibility of the Contractor regardless of job-control testing responsibilities unless otherwise shown on the plans or as directed. Testing result interpretation for opening to traffic is subject to approval.

- 4.11.1. **Protection of Pavement.** Erect and maintain barricades and other standard and approved devices that will exclude all vehicles and equipment from the newly placed pavement for the periods specified. Protect the pavement from damage due to crossings using approved methods before opening to traffic. Where a detour is not readily available or economically feasible, an occasional crossing of the roadway with overweight equipment may be permitted for relocating equipment only but not for hauling material. When an occasional crossing of overweight equipment is permitted, temporary matting or other approved methods may be required.

Maintain an adequate supply of sheeting or other material to cover and protect fresh concrete surface from weather damage. Apply as needed to protect the pavement surface from weather.

- 4.11.2. **Opening Pavement to All Traffic.** Pavement that is 7 days old may be opened to all traffic. Clean pavement, place stable material against the pavement edges, seal joints, and perform all other traffic safety related work before opening to traffic.
- 4.11.3. **Opening Pavement to Construction Equipment.** Unless otherwise shown on the plans, concrete pavement may be opened early to concrete paving equipment and related delivery equipment after the concrete is at least 48 hr. old and opening strength has been demonstrated in accordance with Section 360.4.11.4., “Early Opening to All Traffic,” before curing is complete. Keep delivery equipment at least 2 ft. from the edge of the concrete pavement. Keep tracks of the paving equipment at least 1 ft. from the pavement edge. Protect textured surfaces from the paving equipment. Restore damaged membrane curing as soon as possible. Repair pavement damaged by paving or delivery equipment before opening to all traffic.
- 4.11.4. **Early Opening to All Traffic.** Concrete pavement may be opened after curing is complete and the concrete has attained a flexural strength of 450 psi or a compressive strength of 3,200 psi, except that pavement using Class HES concrete may be opened after 24 hr. if the specified strength is achieved.
- 4.11.4.1. **Strength Testing.** Test concrete specimens cured under the same conditions as the portion of the pavement involved.
- 4.11.4.2. **Maturity Method.** Use the maturity method, [Tex-426-A](#), to estimate concrete strength for early opening pavement to traffic unless otherwise shown on the plans. Install at least 2 maturity sensors for each day’s placement in areas where the maturity method will be used for early opening. Maturity sensors, when used, will be installed near the day’s final placement for areas being evaluated for early opening. Use test specimens to verify the strength–maturity relationship in accordance with [Tex-426-A](#), starting with the first day’s placement corresponding to the early opening pavement section.
- Verify the strength–maturity relationship at least every 10 days of production after the first day. Establish a new strength–maturity relationship when the strength specimens deviate more than 10% from the maturity-estimated strengths. Suspend use of the maturity method for opening pavements to traffic when the strength–maturity relationship deviates by more than 10% until a new strength–maturity relationship is established.
- The Engineer will determine the frequency of verification when the maturity method is used intermittently or for only specific areas.
- 4.11.5. **Fast Track Concrete Pavement.** Open the pavement after the concrete has been cured for at least 8 hr. and attained a minimum compressive strength of 1,800 psi or a minimum flexural strength of 255 psi when tested in accordance with Section 360.4.11.4.1., “Strength Testing,” or Section 360.4.11.4.2., “Maturity Method,” unless otherwise directed. Cover the pavement with insulating blankets when the air temperature is below 65°F until the pavement is opened to traffic.
- 4.11.6. **Emergency Opening to Traffic.** Open the pavement to traffic under emergency conditions, when the pavement is at least 72 hr. old when directed in writing. Remove all obstructing materials, place stable material against the pavement edges, and perform other work involved in providing for the safety of traffic as required for emergency opening.
- 4.12. **Pavement Thickness.** The Engineer will check the thickness in accordance with [Tex-423-A](#) unless other methods are shown on the plans. The Engineer will perform 1 thickness test consisting of 1 reading at approximately the center of the paving equipment every 500 ft. or fraction thereof. Core where directed, in accordance with [Tex-424-A](#), to verify deficiencies of more than 0.2 in. from plan thickness and to determine the limits of deficiencies of more than 0.75 in. from plan thickness. Fill core holes using an approved concrete mixture and method.
- 4.12.1. **Thickness Deficiencies Greater than 0.2 in.** Take one 4-in. diameter core at that location to verify the measurement when any depth test measured in accordance with [Tex-423-A](#) is deficient by more than 0.2 in. from the plan thickness.

Take 2 additional cores from the unit (as defined in Section 360.4.12.3., "Pavement Units for Payment Adjustment" at intervals of at least 150 ft. and at selected locations if the core is deficient by more than 0.2 in., but not by more than 0.75 in. from the plan thickness, and determine the thickness of the unit for payment purposes by averaging the length of the 3 cores. In calculations of the average thickness of this unit of pavement, measurements in excess of the specified thickness by more than 0.2 in. will be considered as the specified thickness plus 0.2 in.

- 4.12.2. **Thickness Deficiencies Greater than 0.75 in.** Take additional cores at 10-ft. intervals in each direction parallel to the centerline to determine the boundary of the deficient area if a core is deficient by more than 0.75 in. The Engineer will evaluate any area of pavement found deficient in thickness by more than 0.75 in., but not more than 1 in. Remove and replace the deficient areas without additional compensation or retain deficient areas without compensation, as directed. Remove and replace any area of pavement found deficient in thickness by more than 1 in. without additional compensation.
- 4.12.3. **Pavement Units for Payment Adjustment.** Limits for applying a payment adjustment for deficient pavement thickness from 0.20 in. to not more than 0.75 in. are 500 ft. of pavement in each lane. Lane width will be as shown on typical sections and pavement design standards.

For greater than 0.75 in. deficient thickness, the limits for applying zero payment or requiring removal will be defined by coring or equivalent nondestructive means as determined by the Engineer. The remaining portion of the unit determined to be less than 0.75 in. deficient will be subject to the payment adjustment based on the average core thickness at each end of the 10-ft. interval investigation as determined by the Engineer.

Shoulders will be measured for thickness unless otherwise shown on the plans. Shoulders 6 ft. wide or wider will be considered as lanes. Shoulders less than 6 ft. wide will be considered part of the adjacent lane.

Limits for applying payment adjustment for deficient pavement thickness for ramps, widenings, acceleration and deceleration lanes, and other miscellaneous areas are 500 ft. in length. Areas less than 500 ft. in length will be individually evaluated for payment adjustment based on the plan area.

- 4.13. **Ride Quality.** Measure ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces," unless otherwise shown on the plans.

5. MEASUREMENT

This Item will be measured as follows:

- 5.1. **Concrete Pavement.** Concrete pavement will be measured by the square yard of surface area in place. The surface area includes the portion of the pavement slab extending beneath the curb.
- 5.2. **Curb.** Curb on concrete pavement will be measured by the foot in place.

6. PAYMENT

These prices are full compensation for materials, equipment, labor, tools, and incidentals.

- 6.1. **Concrete Pavement.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the adjusted unit price bid for "Concrete Pavement" of the type and depth specified as adjusted in accordance with Section 360.6.2., "Deficient Thickness Adjustment."
- 6.2. **Deficient Thickness Adjustment.** Where the average thickness of pavement is deficient in thickness by more than 0.2 in. but not more than 0.75 in., payment will be made using the adjustment factor as specified in Table 2 applied to the bid price for the deficient area for each unit as defined under Section 360.4.12.3., "Pavement Units for Payment Adjustment."

Table 2
Deficient Thickness Price Adjustment Factor

Deficiency in Thickness Determined by Cores (in.)	Proportional Part of Contract Price Allowed (Adjustment Factor)
Not deficient	1.00
Over 0.00 through 0.20	1.00
Over 0.20 through 0.30	0.80
Over 0.30 through 0.40	0.72
Over 0.40 through 0.50	0.68
Over 0.50 through 0.75	0.57

- 6.3. **Curb.** Work performed and furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Curb" of the type specified.

Item 416

Drilled Shaft Foundations



1. DESCRIPTION

Construct foundations consisting of reinforced or non-reinforced concrete drilled shafts.

2. MATERIALS

Use materials that meet the requirements of the following Items.

- Item 421, "Hydraulic Cement Concrete,"
- Item 440, "Reinforcement for Concrete," and
- Item 448, "Structural Field Welding."

Use concrete for drilled shafts that meets the requirements of Table 1 unless otherwise shown on the plans.

Table 1
Concrete for Drilled Shafts

Drilled Shaft Type	Concrete
Non-reinforced	Class A
Reinforced	Class C
Slurry and underwater concrete placement	Class SS

Use coarse aggregate Grade 4, 5, or 6 for drilled shaft concrete in reinforced drilled shafts. Grade 2 or 3 may be used if the shaft is dry and reinforcing steel has a 5 in. minimum clear spacing.

Use a water-reducing, retarding admixture in accordance with [DMS-4640](#), "Chemical Admixtures for Concrete," in all concrete when using casing that will be pulled or when placing shafts underwater or under slurry.

Use concrete with slump that meets the requirements of Table 2 as determined by [Tex-415-A](#).

Table 2
Slump Requirements

Placement Type	Minimum Acceptable Placement Slump, in.	Recommended Design and Placement Slump, in.	Maximum Acceptable Placement Slump, in.
Dry	5-1/2	6-1/2	7-1/2
Underwater and under slurry	7	8	9

Perform a slump loss test in accordance with [Tex-430-A](#) before beginning work when casing is to be pulled or concrete is to be placed underwater or under slurry. Provide concrete that will maintain a slump of at least 4 in. throughout the entire anticipated time of concrete placement. Time of concrete placement is described in Section 416.3.6., "Concrete," and Section 416.3.7., "Additional Requirements for Slurry Displacement or Underwater Concrete Placement Methods." Note the temperature of the concrete mix at the beginning of the slump loss test. Place the concrete if its temperature at the time of placement into the drilled shaft is no more than 10°F higher than the slump loss test temperature. Use ice or other concrete cooling ingredients to lower concrete temperature, or run additional slump loss tests at the higher temperatures. Slump loss testing will be waived if anticipated time of concrete placement is less than 90 minutes.

Use mineral drilling slurry that meets the requirements of Table 3, as determined by [Tex-130-E](#). Determine pH of slurry by [Tex-128-E](#) or pH paper strips.

Table 3
Mineral Slurry Requirements

Before Introduction into the Excavation			Sampled from the Bottom of the Excavation before Concreting		
Specific Gravity	Sand Content	pH	Specific Gravity	Viscosity (sec.)	Sand Content
≤ 1.10	≤ 1%	8–11	≤ 1.15	≤ 45	≤ 4%

Use mineral slurry consisting of processed bentonite or attapulgite clays mixed with clean fresh water. Do not use partially hydrolyzed polyacrylamide (PHPA) polymeric slurry or any blended mineral-polymer slurry.

If approved, water may be used as the drilling fluid. In this case, all of the provisions of Table 3 must be met except that the maximum specific gravity is not to exceed 1.12.

Sample slurry from the bottom of the hole, before placing concrete, and test it in accordance with [Tex-130-E](#). Use a pump or air lift to remove slurry that does not meet the requirements of Table 3 while adding fresh clean slurry to the top of the hole to maintain the slurry level. Continue this operation until the slurry sampled from the bottom of the hole meets the requirements.

3. CONSTRUCTION

Submit Drilled Shaft installation plan for review no later than one month before drilled shaft construction. Include the following in the plan:

- Name and experience record of the drilled shaft superintendent who will be in charge of drilled shaft operations for this project.
- List of proposed equipment to be used, including cranes, drills, augers, bailing buckets, final cleaning equipment, desanding equipment, slurry pumps, core sampling equipment, tremies or concrete pumps, casing, etc.
- Details of overall construction operation sequence and the sequence of shaft construction in bents or groups.
- Details of shaft excavation methods.
- When the use of slurry is anticipated, details of the slurry mix design and its suitability for the subsurface conditions at the construction site, mixing and storage methods, maintenance methods and disposal procedures.
- Details of methods to clean the shaft excavation.
- Details of reinforcement placement, including support and centralization methods.
- Details of concrete placement, including proposed operational procedures for free fall, tremie or pumping methods.
- Details of casing installation and removal methods.

The installation plan will be reviewed for conformance with the plans, specifications and special provisions. The Contractor will be notified within 14 days of receipt of the installation plan of any additional information required and/or changes necessary to meet the contract requirements. All procedural approvals given will be subject to trial in the field and will not relieve the Contractor of the responsibility to satisfactorily complete the work as detailed in the plans and specifications.

Place the shaft to within the following tolerances:

- Vertical plumbness—1 in. per 10 feet of depth.
- Center of shaft located under column—1 in. of horizontal plan position.
- Center of shaft located under footing—3 in. of horizontal plan position.

Complete the embankment at bridge ends before installing drilled shafts that pass through the fill. Refer to Item 423, "Retaining Walls," for provisions for drilled shafts passing through the structural volume of retaining walls.

- 3.1. **Excavation.** The plans indicate the expected depths and elevations for encountering satisfactory bearing material. Excavate as required for the shafts through all materials encountered to the dimensions and elevations shown on the plans or required by the site conditions. Removal of man-made obstructions not shown on the plans will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method." Adjust the bottom of the shaft or alter the foundation if satisfactory founding material is not encountered at plan elevation, as approved to satisfactorily comply with design requirements. Blasting is not allowed for excavations.
- Stop drilling if caving conditions are encountered, and adopt a construction method that stabilizes the shaft walls.
- Do not excavate a shaft within 2 shaft diameters (clear) of an open shaft excavation, or one in which concrete has been placed in the preceding 24 hr.
- Dispose of material excavated from shafts and not incorporated into the finished project in accordance with the plans and with federal, state, and local laws.
- Provide suitable access, lighting, and equipment for proper inspection of the completed excavation and checking the dimensions and alignment of shafts excavation.
- 3.2. **Core Holes.** Take cores to determine the character of the supporting materials if directed. Use a method that will result in recovery of an intact sample adequate for judging the character of the founding material. Such cores should be at least 5 ft. deeper than the proposed founding grade or a depth equal to the diameter of the shaft, whichever is greater. Take these cores when the excavation is complete.
- 3.3. **Casing.** Use casing when necessary to prevent caving of the material, to exclude ground water, when slurry is used for hole stabilization, or when required as part of the Contractor's Safety Plan. Provide casing with an outside diameter not less than the specified diameter of the shaft. The portion of shaft below the casing may be as much as 2 in. smaller than the specified shaft diameter. No extra compensation will be made for concrete required to fill an oversized casing or oversized excavation. Use casing strong enough to withstand handling stresses and pressures of concrete and of the surrounding earth or water, and that is watertight, smooth, clean, and free of accumulations of hardened concrete.
- Use construction methods that result in a minimal amount of disturbed soil being trapped outside the casing. This does not apply to temporary undersized casings used to protect workers inside shafts or to drilled shafts designed for point bearing only.
- Leave casing in place only if authorized or shown on the plans. Extract casing only after placing the concrete to an appropriate level. Maintain sufficient concrete in the casing at all times to counteract soil and water pressure. Rotate or move the casing up or down a few inches if necessary before and during concrete placement to facilitate extraction of the casing.
- 3.4. **Requirements for Slurry Displacement Method.** When soil conditions warrant, use the slurry displacement method to construct drilled shafts unless otherwise shown on the plans. Use this method to support the sides of the excavation with processed mineral slurry that is then displaced by concrete to form a continuous concrete shaft.
- Install surface casing to a minimum of 10 ft. below existing ground before introducing slurry. Do not use casing other than surface casing. Do not use surface casing longer than 20 ft. without approval. Do not extract the surface casing until after placing the concrete.
- Pre-mix slurry in a reservoir with enough capacity to fill the excavation and for recovery of the slurry during concrete placement. Do not mix slurry in the shaft excavation or other hole. Allow adequate time for hydration of the slurry before introduction into the excavation.
- Maintain a head of slurry in the shaft excavation at or near ground level or higher, as necessary, to counteract ground water pressure during and after drilling.

Use an air lift or proper size cleanout bucket, just before placing reinforcing steel, to remove any material that may have fallen from the sides of the excavation or accumulated on the bottom after the completion of drilling. Use a cleanout bucket if material is too large to be picked up with an air lift.

Re-process the hole with the auger as directed if concrete placement is not started within 4 hr. of the completion of the shaft excavation. Then clean the bottom with an air lift or cleanout bucket, and check the slurry at the bottom of the hole for compliance with the slurry requirements of Article 416.2., "Materials."

Agitate the congealed slurry to liquefaction if the slurry forms a gel before concrete placement, and whenever directed.

Recover and dispose of all slurry as approved, and in accordance with all federal, state, and local laws. Do not discharge slurry into or in close proximity to streams or other bodies of water.

- 3.5. **Reinforcing Steel.** Completely assemble the cage of reinforcing steel, and place it as a unit immediately before concrete placement. The cage consists of longitudinal bars and lateral reinforcement (spiral reinforcement, lateral ties, or horizontal bands). Connect individual segments with couplers or by lapping steel as approved if overhead obstacles prevent placement of the cage as a single unit.

Extend the reinforcing steel cage as follows if the shaft is lengthened beyond plan length unless directed otherwise.

- Extend the cage to the bottom for shafts supporting structures other than bridges.
- Extend the cage to 25 ft. or to the bottom, whichever is shorter, for bridge shafts with plan lengths less than 25 ft.
- Do not extend the cage for bridge shafts with plan lengths at least 25 ft. that are lengthened less than 33% of plan length.
- Extend the cage as directed for bridge shafts with plan lengths at least 25 ft. that are lengthened more than 33% of plan length.

If the cage does not reach the bottom of the shaft, it may be suspended, or a portion of the longitudinal steel may be extended to support the cage on the bottom of the shaft. Bars used to extend or support the cage may be lap spliced or welded by a qualified welder. Place the extension at the bottom of the shaft.

Tie spiral reinforcement to the longitudinal bars at a spacing no more than 24 in., or as required for a stable cage. Ensure lateral reinforcement is not welded to longitudinal bars unless otherwise shown on the plans.

Center the reinforcing steel cage in the excavation using approved "roller" type centering devices unless otherwise approved. Use concrete or plastic chairs to keep the reinforcing cage off of the bottom of the hole. Use centering devices starting at 1.5 ft. off from the bottom of the cage and spaced vertically at intervals not exceeding 10 ft. Use a minimum of 3 centering devices per level at a spacing not to exceed 30 in. Flat or crescent-shaped centralizers ("sleds") are not allowed.

Support or hold down the cage to control vertical displacement during concrete placement or extraction of the casing. Use support that is concentric with the cage to prevent racking and distortion of the steel.

Check the elevation of the top of the steel cage before and after concrete placement or after casing extraction when casing is used. Downward movement of the steel up to 6 in. per 20 feet of shaft length and upward movement of the steel up to 6 in. total are acceptable.

Maintain the minimum length of steel required for lap with column steel. Use dowel bars if the proper lap length is provided both into the shaft and into the column. Locate and tie all dowel bars into the cage before placing concrete or insert dowel bars into fresh, workable concrete.

Locate and tie anchor bolts when required before placement of concrete. Use templates or other devices to assure accurate placement of anchor bolts.

- 3.6. **Concrete.** Perform all work in accordance with Item 420, "Concrete Substructures." Provide concrete with maximum placement temperatures as specified in Table 4. Provide thermal analysis to show and temperature recording devices to verify maximum core temperature requirements are met as specified in Section 420.4.7.14., "Mass Placements," as directed.

Table 4
Maximum Concrete Placing Temperature

Shaft Size	Mix Design Options 1–5	Mix Design Options 6–8
Diameter < 5 ft.	95°F	95°F
5 ft. ≤ Diameter ≤ 7 ft.	95°F	85°F
7 ft. < Diameter	85°F	75°F

Form portions of drilled shaft that project above natural ground.

Remove loose material and accumulated seep water from the bottom of the excavation before placing concrete. Place concrete using underwater placement methods if water cannot be removed.

Place concrete as soon as possible after all excavation is complete and reinforcing steel is placed. Provide workable concrete that does not require vibrating or rodding. Vibrate formed portions of drilled shafts.

Place concrete continuously for the entire length of the shaft. Limit free fall of concrete to 25 ft. for dry shafts of 24 in. or smaller diameter. Use a suitable tube or tremie to prevent segregation of materials. Use a tube or tremie in sections to provide proper discharge and permit raising as the placement progresses. For dry shafts over 24 in. diameter, concrete can be allowed to free fall an unlimited distance if it does not strike the reinforcing cage or sides of the hole during placement. Provide a hopper with a minimum 3-ft. long drop-tube at the top of the shaft to direct concrete vertically down the center of the shaft when free fall is used. Do not use a shovel or other means to simply deflect the concrete discharge from the truck.

Maintain a sufficient head of concrete for cased shafts at all times above the bottom of the casing to overcome hydrostatic pressure. Extract casing at a slow, uniform rate with the pull in line with the axis of the shaft. Monitor the concrete level in the casing during extraction. Stop the extraction and add concrete to the casing as required to ensure a completely full hole upon casing removal. The elapsed time from the mixing of the first concrete placed into the cased portion of the shaft until the completion of extraction of the casing must not exceed the time for which the concrete maintains a slump of over 4 in. in accordance with Article 416.2., "Materials." Modify the concrete mix, the construction procedures, or both for subsequent shafts if the elapsed time is exceeded.

Cure the top surface and treat any construction joint area in accordance with Item 420, "Concrete Substructures."

- 3.7. **Additional Requirements for Slurry Displacement or Underwater Concrete Placement Methods.** Place concrete on the same day the shaft is excavated and as soon as possible after all excavation is complete and reinforcing steel is placed. Use an air lift or cleanout bucket of the proper size to clean the bottom of the excavation before placing the reinforcing steel cage and concrete. Place concrete through a closed tremie or pump it to the bottom of the excavation. The minimum tremie diameter will be at least 6 times the maximum size of aggregate used in the concrete mix but not less than 10 in. Initially seal the tremie or pump line to positively separate the concrete from the slurry or water. Place concrete continuously from the beginning of placement until the shaft is completed. Keep the tremie full of concrete and well submerged in the previously placed concrete at all times if using a tremie. Raise the tremie as necessary to maintain the free flow of concrete and the stability of any casing used. Keep the discharge tube submerged in the previously placed concrete at all times if using a pump. Place additional concrete to ensure the removal of any contaminated concrete at the top of the shaft. Allow the top portion of concrete to flush completely from the hole at the completion of the pour until there is no evidence of slurry or water contamination. Do not attempt to remove this concrete with shovels, pumps, or other means. Level the top of shaft with hand tools as necessary.

Use a sump or other approved method to channel displaced fluid and concrete away from the shaft excavation. Recover slurry and dispose of it as approved. Do not discharge displaced fluids into or near

streams or other bodies of water. Provide a collar or other means of capturing slurry and the top portion of concrete flushed from the shaft for pours over water.

Remove the tube, reseal it at the bottom, penetrate with the tube into the concrete already placed by at least 5 ft., and recharge it before continuing if concrete placement is interrupted due to withdrawal of the submerged end of the tremie or pump discharge tube before completion. If this condition exists, notify the Engineer and note the elevation and circumstances related to the loss of seal on the drilled shaft log.

The elapsed time from the mixing of the first concrete placed until the completion of concrete placement, including extraction of the casing, must not exceed the time for which the concrete maintains a slump of over 4 in. in accordance with Article 416.2., "Materials." Modify the concrete mix, the construction procedures, or both for subsequent shafts if the elapsed time is exceeded.

- 3.8. **Test Load.** Load test shafts, if required, in accordance with Item 405, "Foundation Load Test."
- 3.9. **Trial Shaft.** When required on the plans, construct trial shafts to the depth and diameter specified on the plans. Trial shafts include: drilling the hole, placement of the rebar cage (unless otherwise stated), and placement of the concrete. When trial shafts are required, delay start of production shafts until successful completion of trial shafts.

4. MEASUREMENT

- 4.1. **Drilled Shaft.** Drilled shaft foundations will be measured by the foot to the bottom of the shaft.
- 4.1.1. **Interior Bents and Piers.** Shafts will be measured from a point approximately 6 in. below the finished earthwork elevation at the center of each shaft, unless specific elevations or dimensions are indicated on the plans or unless otherwise directed to meet unusual conditions. The bent height shown on the plans is for estimating purposes only and does not control the top-of-shaft measurement.
- 4.1.2. **Abutment Bents and Retaining Walls.** Shafts will be measured from the bottom of footing or cap elevation.
- 4.1.3. **Other Non-Bridge Structures.** Shafts, including trial shafts, will be measured from the top of the shaft.
- 4.2. **Core Hole.** Core holes will be measured by each core hole drilled.

5. PAYMENT

The unit prices bid for the various classifications of drilled shafts will be full compensation for excavation; furnishing, placing, and removing casing; furnishing, processing, and recovering slurry; furnishing, and placing reinforcing steel; pumping; furnishing and placing concrete, including additional concrete required to fill an oversize casing or oversize excavation; conducting slump loss tests; backfilling; disposing of cuttings and slurry; and materials, tools, equipment, labor, and incidentals.

When the bottom of a drilled shaft is placed at an elevation below plan grade, no direct payment will be made for extra reinforcement placed to support the cage. The extra reinforcement will be considered subsidiary to the price bid per foot of shaft. No extra payment will be made for casings left in place.

No payment will be made for "Drilled Shaft" until the concrete has been placed.

- 5.1. **Drilled Shaft.** 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 "Drilled Shaft," "Drilled Shaft (Non-reinforced)," "Drilled Shaft (Sign Mounts)," "Drilled Shaft (High Mast Pole)," "Drilled Shaft (Roadway Illumination Pole)," or "Drilled Shaft (Traffic Signal Pole)" of the specified diameter, subject to the limitations for overruns authorized by the Engineer given in Section 416.5.1.1., "Overrun."

- 5.1.1. **Overrun.** Payment for individual completed shaft lengths up to and including 5 ft. in excess of the maximum plan length shaft, as defined in Section 416.5.1.2., "Maximum Plan Length Shaft," will be made at the unit price bid per foot of the specified diameter.

Payment for the portion of individual completed shaft length in excess of 5 ft. and up to and including 15 ft. more than the maximum plan length shaft, as defined in this Item, will be made at a unit price equal to 115% of the unit price bid per foot of the specified diameter.

Payment for the portion of individual completed shaft length in excess of 15 ft. more than the maximum plan length shaft, as defined in Section 416.5.1.2., "Maximum Plan Length Shaft," will be made at a unit price equal to 125% of the unit price bid per foot of the specified diameter.

- 5.1.2. **Maximum Plan Length Shaft.** Payment described above is subject to the following provisions for extra depth drilling:

- For bridge structures, the maximum plan length shaft is the maximum length shaft, regardless of diameter, for any drilled shaft on that specific bridge.
- For retaining walls, the maximum plan length shaft is the maximum length shaft, regardless of diameter, for any drilled shaft on that specific retaining wall.
- For overhead sign structures, the maximum plan length shaft is the maximum length shaft, regardless of diameter, for any overhead sign structures included in the Contract.
- For high mast illumination poles, the maximum plan length shaft is the maximum length shaft, regardless of diameter, for any high mast illumination pole included in the Contract.
- For roadway illumination poles, the maximum plan length shaft is the maximum length shaft, regardless of diameter, for any roadway illumination pole included in the Contract.
- For traffic signal poles, the maximum plan length shaft is the maximum length shaft, regardless of diameter, for any traffic signal pole included in the Contract.

- 5.2. **Core Hole.** Core holes will be paid at \$200 each.

Item 618

Conduit



1. DESCRIPTION

Furnish and install conduit.

2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 400, "Excavation and Backfill for Structures"
- Item 476, "Jacking, Boring, or Tunneling Pipe or Box"

When specified on the plans, provide:

- rigid metal conduit (RMC);
- intermediate metal conduit (IMC);
- electrical metallic tubing (EMT);
- polyvinyl chloride (PVC) conduit;
- high density polyethylene (HDPE) conduit;
- liquidtight flexible metal conduit (LFMC); or
- liquidtight flexible nonmetallic conduit (LFNC).

Furnish conduit from new materials in accordance with [DMS-11030](#), "Conduit."

Provide prequalified conduit from the Department's MPL. When required by the Engineer, notify the Department in writing of selected materials from the MPL intended for use on each project.

Provide other types of conduit not on the MPL that comply with the details shown on the plans and the NEC. Fabricate fittings such as junction boxes and expansion joints from a material similar to the connecting conduit, unless otherwise shown on the plans. Use watertight fittings. Do not use set screw and pressure-cast fittings. Steel compression fittings are permissible. When using HDPE conduit, provide fittings that are UL-listed as electrical conduit connectors or thermally fused using an electrically heated wound wire resistance welding method.

Use red 3-in. 4-mil polyethylene underground warning tape that continuously states "Caution Buried Electrical Line Below."

3. CONSTRUCTION

Perform work in accordance with the details shown on the plans and the requirements of this Item.

Use established industry and utility safety practices when installing conduit located near underground utilities. Consult with the appropriate utility company before beginning work.

Install conduit a minimum of 18 in. deep below finished grade unless otherwise shown on the plans. Meet the requirements of the NEC when installing conduit. Secure and support conduit placed for concrete encasement in such a manner that the alignment will not be disturbed during placement of the concrete. Cap ends of conduit and close box openings before concrete is placed.

Ream conduit to remove burrs and sharp edges. Use a standard conduit cutting die with a 3/4-in. taper per foot when conduit is threaded in the field. Fasten conduit placed on structures with conduit straps or hangers as shown on the plans or as directed. Fasten conduit within 3 ft. of each box or fitting and at other locations shown on the plans or as directed. Use metal conduit clamps that are galvanized malleable or stainless steel unless otherwise shown on the plans. Use 2-hole type clamps for 2-in. diameter or larger conduit.

Fit PVC and HDPE conduit terminations with bushings or bell ends. Fit metal conduit terminations with a grounding type bushing, except conduit used for duct cable casing that does not terminate in a ground box and is not exposed at any point. Conduit terminating in threaded bossed fittings does not need a bushing. Before installation of conductors or final acceptance, pull a properly sized mandrel or piston through the conduit to ensure that it is free from obstruction. Cap or plug empty conduit placed for future use.

Perform trench excavation and backfilling as shown on the plans or as directed, and in accordance with Item 400, "Excavation and Backfill for Structures." Excavation and backfilling will be subsidiary to the installation of the conduit.

Jack and bore as shown on the plans or as directed, and in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box."

Place warning tape approximately 10 in. above trenched conduit. Where existing surfacing is removed for placing conduit, repair by backfilling with material equal in composition and density to the surrounding areas and by replacing any removed surfacing, such as asphalt pavement or concrete riprap, with like material to equivalent condition. Mark conduit locations as directed.

4. MEASUREMENT

This Item will be measured by the foot of conduit.

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

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Conduit" of the type and size specified and the installation method specified as applicable. This price is full compensation for furnishing and installing conduit; hanging, strapping, jacking, boring, tunneling, trenching, and furnishing and placing backfill; encasing in steel or concrete; replacing pavement structure, sod, riprap, curbs, or other surface; marking location of conduit (when required); furnishing and installing fittings, junction boxes, and expansion joints; and materials, equipment, labor, tools, and incidentals.

Flexible conduit will not be paid for directly but will be subsidiary to pertinent Items. Unless otherwise shown on the plans, no payment will be allowed under this Item for conduit used on electrical services or in foundations.

Item 620

Electrical Conductors



1. DESCRIPTION

Furnish and install electrical conductors, except conductors specifically covered by other Items.

2. MATERIALS

Provide new materials that comply with the details shown on the plans and the requirements of this Item. Use stranded insulated conductors that are rated for 600 volts; approved for wet locations; and marked in accordance with UL, NEC, and CSA requirements. Furnish electrical conductors in accordance with [DMS-11040](#), "Electrical Conductors."

Provide prequalified electrical conductors from the Department's MPL. When required by the Engineer, notify the Department in writing of selected materials from the MPL intended for use on each project.

Ensure all grounding conductors size 8 AWG and larger are stranded, except for the grounding electrode conductor at the electrical service, which will be a solid conductor.

Use white insulation for grounded (neutral) conductors, except grounded conductors size 4 AWG and larger may be black with white tape marking at every accessible location. Do not use white insulation or marking for any other conductor except control wiring specifically shown on the plans.

Ensure insulated grounding conductors are green except insulated grounding conductors size 4 AWG and larger may be black with green tape marking at every accessible location. Do not use green insulation or marking for any other conductor except control wiring specifically shown on the plans.

3. CONSTRUCTION

Perform work in accordance with the details shown on the plans and the requirements of this Item.

Splice conductors only in junction boxes, ground boxes, and transformer bases, and in poles and structures at the handholes. Splice as shown on the plans. Do not exceed the manufacturer's recommended pulling tension. Use lubricant as recommended by the manufacturer. Install conductors in accordance with the NEC.

Make insulation resistance tests on the conductors before making final connections, and ensure each continuous run of insulated conductor has a minimum DC resistance of 5 megohms when tested at 1,000 volts DC. The Engineer may require verification testing of all or part of the conductor system. The Engineer will witness these verification tests. Replace conductors exhibiting an insulation resistance of less than 5 megohms at no additional cost to the Department.

4. MEASUREMENT

This Item will be measured by the foot of each single conductor.

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

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Electrical Conductors" of the types and sizes specified. This price is full compensation for furnishing, installing, and testing electrical conductors; furnishing and installing breakaway connectors; and for materials, equipment, labor, tools, and incidentals, except:

- conductors used in connecting the components of electrical services will be paid for under Item 628, "Electrical Services";
- conductors inside roadway illumination assemblies will be paid for under Item 610, "Roadway Illumination Assemblies";
- conductors inside of traffic signal pole assemblies will be paid for under this Item; and
- conductors used for internal wiring of equipment will not be paid for directly but will be subsidiary to pertinent Items.

Item 621

Tray Cable



1. DESCRIPTION

Furnish and install tray cable.

2. MATERIALS

Provide new materials that comply with the details shown on the plans and meet the requirements of Item 620, "Electrical Conductors."

Furnish tray cable from new materials in accordance with [DMS-11050](#), "Tray Cable."

Provide prequalified tray cable from the Department's MPL. When required by the Engineer, notify the Department in writing of selected materials from the MPL intended for use on each project.

3. CONSTRUCTION

Perform work in accordance with the details shown on the plans and the requirements of this Item.

Provide an additional 5 ft. of cable coiled in each ground box when installing cable in underground conduit. Splice tray cable conductors only at locations shown on the plans. Obtain the Engineer's written approval for each splice. Ensure allowed splices are watertight. Test the cable's conductors after installation and before any connection. Remove and replace tray cable exhibiting a DC insulation resistance of less than 5 megohms at 1,000 volts DC at no additional cost to the Department.

4. MEASUREMENT

This Item will be measured by the foot of tray cable.

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

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Tray Cable" of the types and sizes specified. This price is full compensation for furnishing and installing materials and for equipment, labor, tools, and incidentals.

Item 624

Ground Boxes



1. DESCRIPTION

- **Installation.** Construct, furnish, and install ground boxes complete with lids.
- **Removal.** Remove existing ground boxes.

2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following items:

- Item 420, "Concrete Substructures"
- Item 421, "Hydraulic Cement Concrete"
- Item 432, "Riprap"
- Item 440, "Reinforcement for Concrete"
- Item 618, "Conduit"
- Item 620, "Electrical Conductors"

Provide fabricated precast polymer concrete ground boxes in accordance with [DMS-11070](#), "Ground Boxes." Provide prequalified ground boxes from the Department's MPL. When required by the Engineer, notify the Department in writing of selected materials from the MPL intended for use on each project.

Provide other precast or cast-in-place ground boxes that comply with the details shown on the plans.

3. CONSTRUCTION

Perform work in accordance with the details shown on the plans and the requirements of this Item.

Use established industry and utility safety practices when installing or removing ground boxes located near underground utilities. Consult with the appropriate utility company before beginning work.

- 3.1. **Installation.** Fabricate and install ground boxes in accordance with the details, dimensions, and requirements shown on the plans. Install ground box to approved line and grade.

Construct precast and cast-in-place concrete ground boxes in accordance with Item 420, "Concrete Substructures," and Item 440, "Reinforcement for Concrete."

Construct concrete aprons as shown on the plans and in accordance with Item 432, "Riprap," and Item 440, "Reinforcement for Concrete."

- 3.2. **Removal.** Remove existing ground boxes and concrete aprons to at least 6 in. below the conduit level. Uncover conduit to a sufficient distance so that 90 degree bends can be removed and conduit reconnected. Clean the conduit in accordance with Item 618, "Conduit." Replace conduit within 5 ft. of the ground box. Remove old conductors and install new conductors as shown on the plans. Backfill area with material equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

4. MEASUREMENT

This Item will be measured by each ground box installed complete in place or each ground box removed.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Ground Box" of the types and sizes specified and for "Remove Ground Box."

- 5.1. **Installation.** This price is full compensation for excavating and backfilling; constructing, furnishing, and installing ground boxes and concrete aprons; and material, equipment, labor, tools, and incidentals. All wiring connections required inside the ground box will be considered subsidiary to this bid item. Conduit will be paid for under Item 618, "Conduit." Electrical conductors will be paid for under Item 620, "Electrical Conductors."
- 5.2. **Removal.** This price is full compensation for removing and disassembling ground boxes and concrete aprons; excavating, backfilling, and surface placement; removing old conductors; disposal of unsalvageable materials; and materials, equipment, labor, tools, and incidentals. Cleaning of conduit is subsidiary to this Item. Conduit replaced within 5 ft. of the ground box will be subsidiary to this Item. Additional conduit will be paid for under Item 618, "Conduit." Installation of conductors will be paid for under Item 620, "Electrical Conductors."

Item 628

Electrical Services



1. DESCRIPTION

- Installation. Furnish and install electrical services.
- Relocation. Relocate existing electrical services.
- Removal. Remove existing electrical services.

2. MATERIALS

Provide materials that comply with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 441, "Steel Structures"
- Item 445, "Galvanizing"
- Item 449, "Anchor Bolts"
- Item 618, "Conduit"
- Item 620, "Electrical Conductors"
- Item 627, "Treated Timber Poles"
- Item 656, "Foundations for Traffic Control Devices"

For the installation of electrical services, use new materials that meet the requirements of the NEC, UL, CSA, and NEMA, and are in accordance with [DMS-11080](#), "Electrical Services."

Provide prequalified electrical services prequalified from the Department's MPL. When required by the Engineer, notify the Department in writing of selected materials from the MPL intended for use on each project.

3. CONSTRUCTION

Perform work in accordance with the details shown on the plans and the requirements of this Item. Use established industry and utility safety practices when installing, relocating, or removing electrical services located near overhead or underground utilities. Consult with the appropriate utility company before beginning work.

- 3.1. **Installation.** Furnish and install electrical service equipment. Ensure components of the electrical service meet the requirements of the Electrical Detail Standards. Follow NEC and local utility company requirements when installing the electrical equipment. Coordinate the utility companies' work for providing service.
- 3.2. **Relocation.** Coordinate relocation with the appropriate utility company before beginning work. Remove existing electrical service according to "Removal" under this Item. Reinstall existing electrical service according to "Installation" of this Item. Replace or add circuit breakers as noted on the plans.
- 3.3. **Removal.** Coordinate removal with the appropriate utility company before beginning work. Before the removal of the electrical service, disconnect and isolate any existing electrical service equipment in accordance with the utility company's requirements.

Remove existing electrical service support a minimum of 2 ft. below finish grade unless otherwise shown on the plans. Repair the remaining hole by backfilling with material equal in composition and density to the surrounding area. Replace any surfacing such as asphalt pavement or concrete riprap with like material to equivalent condition.

Disconnect conductors and remove them from the conduit. Cut off all protruding conduit 6 in. below finished grade. Abandoned conduit need not be removed unless shown on the plans.

Reconnect conductors and conduit to be reused when shown on the plans. Make all splices in ground boxes unless otherwise shown on the plans.

Accept ownership of unsalvageable materials, and dispose of them in accordance with federal, state, and local regulations.

4. MEASUREMENT

This Item will be measured by each electrical service installed, relocated, or removed.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Electrical Services" of the types specified, "Relocate Electrical Services," or "Remove Electrical Services."

- 5.1. **Installation.** This price is full compensation for paying all fees, permits, and other costs; making arrangements with the utility company for all work and materials provided by the utility company; furnishing, installing, and connecting all components including poles, service supports, foundations, anchor bolts, riprap, enclosures, switches, breakers, service conduit (from the service equipment including the elbow below ground), fittings, service conductors (from the service equipment including the elbow below ground), brackets, bolts, hangers, hardware; and materials, equipment, labor, tools, and incidentals.

Costs for utility-owned power line extensions, connection charges, meter charges, consumption charges, and other charges will be paid for by the Department. The Department will reimburse the Contractor the amount billed by the utility plus an additional 5% of the invoice cost will be paid for labor, equipment, administrative costs, superintendence, and profit.

- 5.2. **Relocation.** This price is full compensation for disconnecting and isolating the existing electrical service; relocating the service supports; new service support foundation; backfilling holes; paying all fees, permits, and other costs; making arrangements with the utility company for all work and materials provided by the utility company; removing, disconnecting, installing, and connecting all components including poles, service supports, foundations, anchor bolts, riprap, enclosures, switches, breakers, service conduit (from the service equipment including the elbow below ground), fittings, service conductors (from the service equipment including the elbow below ground), brackets, bolts, hangers, hardware; and materials, equipment, labor, tools, and incidentals.

Costs for utility-owned power line extensions, connection charges, meter charges, consumption charges, and other charges will be paid for by the Department. The Department will reimburse the Contractor the amount billed by the utility plus an additional 5% of the invoice cost will be paid for labor, equipment, administrative costs, superintendence, and profit.

- 5.3. **Removal.** This price is full compensation for coordinating with the utility company to disconnect and isolate the electrical service; removing the service supports; backfilling holes; and materials, equipment, labor, tools, and incidentals.

Item 636

Signs



1. DESCRIPTION

- **Installation.** Furnish, fabricate, and erect aluminum signs. Sign supports are provided for under other Items.
- **Replacement.** Replace existing signs on existing sign supports.
- **Refurbishing.** Refurbish existing aluminum signs on existing sign supports.

2. MATERIALS

- 2.1. **Sign Blanks.** Furnish sign blank substrates in accordance with [DMS-7110](#), "Aluminum Sign Blanks," and in accordance with the types shown on the plans. Use single-piece sheet-aluminum substrates for Type A (small) signs and extruded aluminum substrates for Type G (ground-mounted) or Type O (overhead-mounted) signs.
- 2.2. **Sign Face Retroreflectorization.** Retroreflectorize the sign faces with flat surface reflective sheeting. Furnish sheeting that meets [DMS-8300](#), "Sign Face Materials." Use retroreflective sheeting from the same manufacturer for the entire sign face background. Ensure that sign legend, symbols, borders, and background exhibit uniform color, appearance, and retroreflectivity when viewed both day and night.
- 2.3. **Sign Messages.** Fabricate sign messages to the sizes, types, and colors shown on the plans. Use sign message material from the same manufacturer for the entire message of a sign. Use screen ink and background reflective sheeting that are from the same manufacturer when fabricating signs.
- Ensure that the screened messages have clean, sharp edges and exhibit uniform color and retroreflectivity. Prevent runs, sags, and voids. Furnish screen inks in accordance with [DMS-8300](#), "Sign Face Materials."
 - Fabricate colored, transparent film legend, and retroreflectorized sheeting legend from materials that meet [DMS-8300](#), "Sign Face Materials."
 - Fabricate non-reflective black film legend from materials meeting [DMS-8300](#), "Sign Face Materials."
 - Furnish direct-applied route markers and other attachments within the parent sign face unless otherwise specified on the plans.
- 2.4. **Hardware.** Use galvanized steel, stainless steel, or dichromate-sealed aluminum for bolts, nuts, washers, lock washers, screws, and other sign assembly hardware. Use plastic or nylon washers to avoid tearing the reflective sheeting. Furnish steel or aluminum products in accordance with [DMS-7120](#), "Sign Hardware."

When dissimilar metals are used, select or insulate metals to prevent corrosion.

3. CONSTRUCTION

- 3.1. **Fabrication.** Sign fabrication plants that produce permanent highway signs must be approved in accordance with DMS-7390, "Permanent Highway Sign Fabrication Plant Qualification." Furnish signs from prequalified fabrication plants listed in the Department's MPL.
- 3.1.1. **Sign Blanks.** Furnish sign blanks to the sizes and shapes shown on the plans and that are free of buckles, warps, burrs, dents, cockles, or other defects. Do not splice individual extruded aluminum panels.

Complete the fabrication of sign blanks, including the cutting and drilling or punching of holes, before cleaning and degreasing. After cleaning and degreasing, ensure the substrate does not come into contact with grease, oils, or other contaminants before the application of the reflective sheeting.

- 3.1.2. **Sheeting Application.** Apply sheeting to sign blanks in conformance with the sheeting manufacturer's recommended procedures.

When using rotational sensitive white sheeting, fabricate signs by applying the sheeting for cut-out legend, symbols, borders, and route marker attachments within the parent sign face with the identification marks or other orientation features in the optimum rotation as identified by the sheeting manufacturer.

Clean and prepare the outside surface of extruded aluminum flanges in the same manner as the sign panel face.

Minimize the number of splices in the sheeting. Overlap the lap-splices by at least 1/4 in. for encapsulated glass bead sheeting unless otherwise recommended by the reflective sheeting manufacturer. Use butt splices for prismatic reflective sheeting. Provide a 1 ft. minimum dimension for any piece of sheeting. Do not splice sheeting for signs fabricated with transparent screen inks or colored transparent films.

- 3.1.3. **Sign Assembly.** Assemble extruded aluminum signs in accordance with the details shown on the plans. Sign face surface variation must not exceed 1/8 in. per foot. Surface misalignment between panels in multi-panel signs must not exceed 1/16 in. at any point.

- 3.1.4. **Decals.** Code and apply sign identification decals in accordance with Item 643, "Sign Identification Decals."

- 3.2. **Storage and Handling.** Ship, handle, and store completed sign blanks and completed signs so that corners, edges, and faces are not damaged. Damage to the sign face that is not visible when viewed at a distance of 50 ft., night or day, will be acceptable. Replace unacceptable signs.

Store all finished signs off the ground and in a vertical position until erected. Store finished sheet aluminum substrate signs in a weatherproof building. Extruded aluminum substrate signs may be stored outside.

Stockpile salvageable materials at the location shown on the plans or as directed. Accept ownership of unsalvageable materials and dispose of them in accordance with federal, state, and local regulations.

- 3.3. **Cleaning.** Wash completed signs in the fabrication shop with a biodegradable cleaning solution acceptable to the manufacturers of the sheeting, colored transparent film, and screen ink to remove grease, oil, dirt, smears, streaks, finger marks, and other foreign material. Wash again before final inspection after erection.

- 3.4. **Installation.** Install signs as shown on the plans or as directed.

- 3.5. **Replacement.** Remove the existing signs from the existing supports and replace with new signs, including mounting hardware, as shown on the plans.

- 3.6. **Refurbishing.** Refurbish existing signs by providing and installing new messages and mounting hardware. Install new retroreflectorized legend and supplemental signs as shown on the plans.

- 3.7. **Documentation.** Provide the following documentation from the sign fabricator with each shipment of furnished signs:

- A notarized original of the Signing Material Statement (Form 2273) with the proper attachments for verification of compliance, and
- A notarized certification stating that the completed signs were fabricated in accordance with this Item and the plans.

4. MEASUREMENT

Signs installed or replaced will be measured by the square foot of the sign face. Signs refurbished will be measured by each sign.

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

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Aluminum Signs," "Replacing Existing Aluminum Signs," or "Refurbishing Aluminum Signs," of the type specified.

- 5.1. **Installation.** This price is full compensation for furnishing and installing new signs and hardware; fabrication of sign panels; treatment of sign panels required before application of the background materials; application of the background materials and messages to the sign panels; furnishing and fabricating frames, wind beams and stiffeners; furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections; assembling and erecting the signs; preparing and cleaning the signs; and materials, equipment, labor, tools, and incidentals.
- 5.2. **Replacement.** This price is full compensation for furnishing and installing new aluminum signs and hardware; removal of existing signs; fabrication of sign panels; treatment of sign panels required before application of the background materials; application of the background materials and messages to the sign panels; furnishing and fabricating frames, wind beams and stiffeners; furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections; assembling and erecting the signs; preparing and cleaning the signs; salvaging and disposing of unsalvageable materials; and materials, equipment, labor, tools, and incidentals.
- 5.3. **Refurbishing.** This price is full compensation for modifying existing sign messages; removing and replacing existing route markers, reflectorized legend, or supplemental signs attached to the parent sign; preparing and cleaning the signs; furnishing sheeting and hardware; salvaging and disposing of unsalvageable materials; and materials, equipment, labor, tools, and incidentals.

Item 680

Highway Traffic Signals



1. DESCRIPTION

- **Installation.** Install highway traffic signals.
- **Removal.** Remove, store, and salvage traffic signals.

2. MATERIALS

Ensure electrical materials and construction methods conform to the current NEC and additional local utility requirements.

Furnish new materials. Ensure all materials and construction methods conform to the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 610, "Roadway Illumination Assemblies"
- Item 625, "Zinc-Coated Steel Wire Strand"
- Item 627, "Treated Timber Poles"
- Item 636, "Signs"
- Item 656, "Foundations for Traffic Control Devices"

Provide controller assemblies that meet the requirements of [DMS-11170](#), "Fully Actuated, Solid-State Traffic Signal Controller Assembly," and the details shown on the plans.

Provide prequalified controller assemblies from the Department's MPL.

Provide flasher assemblies that meet the requirements of [DMS-11160](#), "Flasher Controller Assembly," and the details shown on the plans.

Provide prequalified flasher assemblies from the Department's MPL.

Sampling and testing of traffic signal controller assemblies will be done in accordance with [Tex-1170-T](#).

3. CONSTRUCTION

3.1. **Installation.** Install traffic signal controller foundations in accordance with Item 656, "Foundations for Traffic Control Devices."

3.1.1. **Electrical Requirements.**

3.1.1.1. **Electrical Services.** Make arrangements for electrical services and install and supply materials not provided by the utility company as shown on the plans. Install 120-volt, single-phase, 60-Hz AC electrical service unless otherwise shown on the plans.

3.1.1.2. **Conduit.** Install conduit and fittings of the sizes and types shown on the plans. Conduit of larger diameter size than that shown on the plans may be used with no additional compensation, providing the same diameter size is used for the entire length of the conduit run. Extend conduit in concrete foundations 2 to 3 in. above the concrete. Seal the ends of each conduit with silicone caulking, or other approved sealant, after all cables and conductors are installed.

- 3.1.1.3. **Wiring.** Furnish stranded No. 12 AWG XHHW conductors. Install above-ground cables and conductors in rigid metal conduit, except for span wire suspended cables and conductors, drip loops, and electrical wiring inside signal poles unless otherwise shown on the plans. Make power entrances to ground-mounted controllers through underground conduit. Wire each signal installation to operate as shown on the plans.
- Attach ends of wires to properly sized self-insulated solderless terminals. Attach terminals to the wires with a ratchet-type compression crimping tool properly sized to the wire. Place pre-numbered identification tags of plastic or tape around each wire adjacent to wire ends in the controller and signal pole terminal blocks.
- Splices will not be permitted except as shown on the plans, unless each individual splice is approved in writing. Make all allowed splices watertight.
- 3.1.1.4. **Grounding and Bonding.** Ground and bond conductors in accordance with the NEC. Ensure the resistance from the grounded point of any equipment to the nearest ground rod is less than 1 ohm.
- Install a continuous bare or green insulated copper wire (equipment ground) throughout the electrical system that is the same size as the neutral conductor, but a minimum No. 8 AWG. Connect the equipment ground to all metal conduit, signal poles, controller housing, electrical service ground, ground rods, and all other metal enclosures and raceways.
- Provide copper wire bonding jumpers that are a minimum No. 8 AWG.
- 3.1.2. **Controller Assemblies.** Construct controller foundations in accordance with Item 656, "Foundations for Traffic Control Devices." Immediately before mounting the controller assembly on the foundation, apply a bead of silicone caulk to seal the cabinet base. Seal any space between conduit entering the controller and the foundation with silicone caulk.
- Deliver the keys for the controller cabinets to the Engineer when the Contract is complete.
- Place the instruction manual and wiring diagrams for all equipment in the controller cabinet, inside the controller cabinet.
- 3.1.3. **Timber Poles.** Furnish ANSI Class 2 timber poles other than for electrical services in accordance with details shown on the plans.
- 3.1.4. **Preservation of Sod, Shrubbery, and Trees.** Replace sod, shrubbery, and trees damaged during the Contract.
- 3.1.5. **Removal and Replacement of Curbs and Walks.** Obtain approval before cutting into or removing walks or curbs not shown on the plans to be removed or replaced. Restore any curbs or walks removed equivalent to original condition after work is completed, to the satisfaction of the Engineer.
- 3.1.6. **Intersection Illumination.** Install luminaires on signal poles as shown on the plans.
- 3.1.7. **Signal Timing Plan.** The traffic signal timing plan will be provided by the Department or local entity.
- 3.1.8. **Test Period.** Operate completed traffic signal installations continuously for at least 30 days in a satisfactory manner. If any Contractor-furnished equipment fails during the 30-day test period, repair or replace that equipment. This repair or replacement, except lamp replacement, will start a new 30-day test period.
- Replace materials that are damaged or have failed before acceptance. Replace failed or damaged existing signal system components when caused by the Contractor. The Department will relieve the Contractor of maintenance responsibilities upon passing a 30-day performance test of the signal system and acceptance of the Contract.

- 3.2. **Removal.** Remove existing electrical services, pedestal poles, strain poles, mast arm pole assemblies, luminaires, signal heads, vehicle detector equipment, controllers, cables, and other accessories. Remove materials so damage does not occur. Remove and store items designated for reuse or salvage at locations shown on the plans or as directed.

Remove abandoned concrete foundations, including steel, to a point 2 ft. below final grade. Backfill holes with material equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

Accept ownership and dispose of unsalvageable materials in accordance with federal, state, and local regulations.

4. MEASUREMENT

This Item will be measured as each traffic signal installed or removed. A traffic signal is a signalized intersection controlled by a single traffic signal controller.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Installation of Highway Traffic Signals" of the type (isolated, system, or flashing beacon) specified, or "Removing Traffic Signals."

- 5.1. **Installation.** This price is full compensation for furnishing, installing, and testing the completed installation, controller and associated equipment, controller foundations, luminaires, signs mounted on signal equipment, damping plates, timber poles, mounting hardware and steel wire strand; preservation and replacement of damaged sod, shrubbery and trees; removal and replacement of curbs and walks; and materials, equipment, labor, tools, and incidentals. The Department will pay for electrical energy consumed by the traffic signal.
- New drilled shaft foundations for traffic signal poles will be paid for under Item 416, "Drilled Shaft Foundations." New conduit will be paid for under Item 618, "Conduit." New electrical conductors will be paid for under Item 620, "Electrical Conductors." New ground boxes will be paid for under Item 624, "Ground Boxes." New electrical services will be paid for under Item 628, "Electrical Services." New vehicle and pedestrian signal heads will be paid for under Item 682, "Vehicle and Pedestrian Signal Heads." New traffic signal cables will be paid for under Item 684, "Traffic Signal Cables." New traffic signal pole assemblies will be paid for under Item 686, "Traffic Signal Pole Assemblies (Steel)." New traffic signal detectors will be paid for under Item 688, "Pedestrian Detectors and Vehicle Loop Detectors."
- 5.2. **Removal.** This price is full compensation for removing the various traffic signal components; removing the foundations; disposal of unsalvageable materials; hauling; and materials, equipment, labor, tools, and incidentals.

Item 682

Vehicle and Pedestrian Signal Heads



1. DESCRIPTION

Furnish and install vehicle and pedestrian signal heads.

2. MATERIALS

Furnish only new materials.

2.1. Definitions.

- **Back Plate.** A thin strip of material extending outward from all sides of a signal head.
- **LED Optical Unit.** The LED lens and associated supporting parts in a signal section.
- **Louwer.** A device mounted to the visor restricting signal face visibility.
- **Signal Section.** One housing case, housing door, visor, and optical unit.
- **Signal Face.** One section or an assembly of 2 or more sections facing one direction.
- **Signal Head.** A unidirectional face or a multidirectional assembly of faces, including back plates and louvers when required, attached at a common location on a support.

2.2. General.

Provide vehicle signal heads in accordance with [DMS-11121](#), "Twelve-Inch LED Traffic Signal Lamp Unit." Provide prequalified vehicle signal heads from the Department's MPL.

Provide pedestrian signal heads in accordance with [DMS-11131](#), "Pedestrian LED Countdown Signal Modules." Provide prequalified pedestrian signal heads from the Department's MPL.

Supply either aluminum or polycarbonate signal head components of the same material and manufacturer for any one project.

Use galvanized steel, stainless steel, or dichromate sealed aluminum bolts, nuts, washers, lock washers, screws, and other assembly hardware. When dissimilar metals are used, ensure the metals are selected or insulated to prevent corrosion.

Use closed-cell silicone or closed-cell neoprene gaskets.

3. CONSTRUCTION

3.1. Assembly.

Assemble individual signal sections in multi-section faces in accordance with the manufacturer's recommendations to form a rigid signal face. Assemble and mount signal heads as shown on the plans. Install louvers and back plates in accordance with the manufacturer's recommendations. Close any openings in an assembled signal head with a plug of the same material and color as the head.

Remove only the existing lens, reflector, and incandescent lamp when installing a retrofit replacement LED traffic signal or pedestrian signal lamp unit into an existing signal housing; fit the new unit securely in the housing door; and connect the new housing unit to the existing electrical wiring or terminal block by means of simple connectors.

3.2. Wiring.

Wire each optical unit to the terminal block located in that signal section by means of solderless wire connectors or binding screws and spade lugs. Wire all sections of a multi-section signal face to the section terminal blocks in which the traffic signal cable is terminated. Maintain the color coding on leads from the

individual optical units throughout the signal head, except for the traffic signal cable. Use solderless wire connectors or binding screws and spade lugs for connections to terminal blocks. Use binding screws and spade lugs for field wiring.

4. MEASUREMENT

This Item will be measured by each vehicle signal section, pedestrian signal section, back plate, or louver.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pedestrian Signal Section," "Vehicle Signal Section," "Back Plate," or "Louver," of the types and sizes specified. This price is full compensation for furnishing, assembling, and installing the signal sections, back plates and louvers, and lenses and optics; mounting attachments; and materials, equipment, labor, tools, and incidentals.

Item 684

Traffic Signal Cables



1. DESCRIPTION

Furnish and install traffic signal cables.

2. MATERIALS

Provide polyethylene-jacketed multi-conductor cables in accordance with details shown on the plans. Individual conductors must be copper with polyethylene insulation rated for 600 volts. Furnish new materials. Provide traffic signal cables in accordance with [DMS-11110](#), "Traffic Signal Cable."

- 2.1. **Type A Cables.** Use Type A cables meeting the requirements of IMSA 20-1 for underground conduit installation or aerial cable supported by a messenger.
- 2.2. **Type B Cables.** Use Type B cables meeting the requirements of IMSA 20-3 as the integral messenger cable for aerial installations.
- 2.3. **Type C Cables.** Use Type C cables meeting the requirements of IMSA 50-2 for loop detector lead-in installations consisting of 2 conductor shielded cable.
- 2.4. **Types A and B Cable Materials.** Provide the following materials for Type A and B cables:
 - Use the size and number of conductors shown on the plans. Unless otherwise shown on the plans, use conductors consisting of 7 copper strands.
 - Ensure color coding of conductors and sequence for cables are in compliance with Table 1. Base color is the insulation color. Tracer color is the colored stripe that is part of or firmly adhered to the insulation surface for the full length of the conductor.
 - Ensure 2-conductor cable is of the round twisted type with fillers used where necessary to form a round cable.
 - For cables with more than 2 conductors, ensure individual conductors are laid up symmetrically in layers with fillers used when necessary, to produce a uniform assembly of conductors with a firm, compact cylindrical core.
 - Ensure fillers are a non-metallic, moisture-resistant, non-wicking material.
 - Supply conductor assemblies covered with a wrapping of a moisture-resistant tape applied to overlap at least 10% of the tape width.
 - Ensure the taped conductor assembly is covered with a tightly fitting black polyethylene jacket that is smooth and free from holes, splits, blisters, and any other imperfections.
 - Supply cables that clearly show the name of the manufacturer and the IMSA specification number applied at approximate 2-ft. intervals to the outer surface of the jacket by indent printing.

Table 1
Conductor Color and Sequence for Cables

Conductor No.	Base Color	Tracer Color
1	Black	
2	White	
3	Red	
4	Green	
5	Orange	
6	Blue	
7	White	Black
8	Red	Black
9	Green	Black
10	Orange	Black
11	Blue	Black
12	Black	White
13	Red	White
14	Green	White
15	Blue	White
16	Black	Red
17	White	Red
18	Orange	Red
19	Blue	Red
20	Red	Green
21	Orange	Green

- 2.5. **Additional Requirements for Type B Cable Materials.** Additional material requirements particular to Type B cable are as follows:
- Ensure cables consisting of 5 or more conductors have a 0.25-in. nominal diameter messenger. For the messenger, use Class A galvanized Extra High Strength Steel Strand with 3 or 7 wires.
 - A solid strand messenger with 0.134-in. diameter may be used for cables with less than 5 conductors.
 - To provide corrosion protection, ensure the messenger strand is coated and the interstices are flooded with a rubber asphalt compound or equivalent.
 - Ensure the integral messenger and conductors are enclosed in the jacket forming a cross-section similar to a figure 8.
- 2.6. **Type C Cable Materials.** Use the following materials for Type C cables:
- Unless otherwise shown on the plans, use No. 14 AWG insulated conductors with concentric stranding with black insulation on 1 of the 2 conductors and clear insulation on the other conductor. Ensure conductors have a minimum of 2 twists per foot within the cable.
 - Use cables that have 100% shield coverage using aluminum bonded to a Mylar film. Ensure the drain wire is stranded tinned copper, 2 AWG sizes less than the conductor, and in continuous contact with the aluminum side of the shield material.
 - Ensure the jacket is black polyethylene.
 - Use cables that legibly show the name of the manufacturer and the IMSA specification number applied at approximate 2-ft. intervals on a tape under the outer jacket.
- 2.7. **Sampling.** The Engineer may take samples from each roll of each size of cable for establishing conformity to IMSA. The samples will be at least 3 ft. long. Replace any cable failing to meet IMSA requirements.

3. CONSTRUCTION

For each cable run in underground conduit, coil an extra 5 ft. of cable in each ground box.

Splices are not permitted in Type A and B cables unless shown on the plans, or approved in writing. Ensure splices are watertight.

Make splices between Type C cable and loop detector wires only in the ground box near the loop the cable is servicing. Use non-corrosive solder for splices. Ground the drain wire of Type C cable to earth ground only at the controller or detector cabinet. Ensure the resistance from the drain wire to the ground rod is less than 1 ohm.

Test the cables after installation and before any connection to the cables. Cables testing less than 50 megohms insulation resistance at 500 volts will be rejected.

4. MEASUREMENT

This Item will be measured by the foot of traffic signal cables.

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

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Traffic Signal Cables" of the types and sizes specified. This price is full compensation for furnishing and installing materials, and for equipment, labor, tools, and incidentals, except as shown below.

Cables inside traffic signal pole assemblies will be paid for under this Item.

Cables used for inside signal heads and controllers or coils in ground boxes, pole bases, and on span wires will not be paid for directly but will be subsidiary to pertinent Items.

Item 686

Traffic Signal Pole Assemblies (Steel)



1. DESCRIPTION

- **Installation.** Fabricate, furnish, and install steel traffic signal pole assemblies.
- **Relocation.** Remove and relocate existing steel traffic signal pole assemblies.

2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 416, "Drilled Shaft Foundations"
- Item 421, "Hydraulic Cement Concrete"
- Item 441, "Steel Structures"
- Item 442, "Metal for Structures"
- Item 445, "Galvanizing"
- Item 449, "Anchor Bolts"

Furnish alloy steel or medium-strength mild steel anchor bolts in accordance with Section 449.2.1., "Bolts and Nuts," unless otherwise shown on the plans.

3. CONSTRUCTION

- 3.1. **Standard Design.** Fabricate poles assemblies in accordance with this Item to the designs shown on the plans. Alternate designs are not acceptable. Deviations that affect the basic structural behavior of the pole are considered to be alternate designs. For deviations that do not affect the basic structural behavior of the pole, electronically submit shop drawings in accordance with Item 441, "Steel Structures," to the Bridge Division for approval.
- 3.2. **Fabrication.** Fabricate and weld in accordance with Item 441, "Steel Structures," AWS D1.1, *Structural Welding Code—Steel*; and the requirements of this Item. Fabrication tolerances are given in Table 1.

Table 1
Fabrication Tolerances

Part	Dimension	Tolerance (in.)
Pole and mast arm shaft	Length	±1
	Thickness	+0.12, -0.02
	Difference between flats or diameter	±3/16
	Straightness	1/8 in 10 ft.
	Attachment locations	±1
Base and mast arm mounting plates	Overall	±3/16
	Thickness	+1/4, -0
	Deviations from flat	3/16 in 24 in.
	Spacing between holes	±1/8
	Bolt hole size	±1/16
Anchor bolts	Length	±1/2
	Threaded Length	±1/2
	Galvanized Length	-1/4
Assembled shafts	Angular Orientation	1/16 in 12 in. ¹
	Centering	±3/16
	Twist	3° in 50 ft.

1. 1/8 in 12 in. between mounting plates and between mounting plates and base plates.

Fabrication plants that produce steel traffic signal pole assemblies must be approved in accordance with [DMS-7380](#), "Steel Non-Bridge Member Fabrication Plant Qualification." The Department maintains an MPL of approved traffic signal pole assembly fabrication plants.

Provide properly fitting components. Provide round or octagonal shafts for poles and mast arms tapered as shown on the plans. Fabricate mast arms straight in the unloaded condition unless otherwise shown on the plans. The Department will accept bolted slip joints overlapping by at least 1.5 diameters in mast arms 40 ft. and longer.

Provide circumferential welds only at the ends of the shafts. Provide no more than 2 longitudinal seam welds in shaft sections. Grind or smooth the exterior of longitudinal seam welds to the same appearance as other shaft surfaces. Ensure 100% penetration within 6 in. of circumferential base welds and 60% minimum penetration at other locations along the longitudinal seam welds. Use a welding technique that minimizes acid entrapment during later galvanizing. Hot-dip galvanize all fabricated parts in accordance with Item 445, "Galvanizing."

Treat welds with Ultrasonic Impact Treatment when shown on the plans after galvanization and with the dead load (actual or simulated) applied. Repair damaged galvanizing in accordance with Section 445.3.5., "Repairs."

Connect the luminaire arm to the pole with simplex fittings. Ensure the fittings have no defects affecting strength or appearance.

Permanently mark, at a visible location when erected, pole base plates and mast arm mounting plates with the design wind speed.

Permanently mark, at a visible location when erected, pole base plates and fixed mast arm mounting plates with the fabrication plant's insignia or trademark. Place the mark on the pole base plate adjacent to the hand-hole access compartment.

Deliver each traffic signal pole assembly with fittings and hardware either installed or packaged with its associated components. Ship all components with a weatherproof tag identifying the manufacturer, Contract number, date, and destination of shipment.

- 3.3. **Installation.** Locate traffic signal pole assemblies as shown on the plans unless otherwise directed to secure a more desirable location or avoid conflict with utilities. Stake the traffic signal pole assembly locations for verification by the Engineer.

Use established industry and utility safety practices when working near overhead or underground utilities. Consult with the appropriate utility before beginning work.

Construct foundations for new traffic signal pole assemblies in accordance with Item 416, "Drilled Shaft Foundations," and the details shown on the plans. Orient anchor bolts as shown on the plans.

Erect structures after foundation concrete has attained its design strength as required on the plans and Item 421, "Hydraulic Cement Concrete." Coat anchor bolt threads and tighten anchor bolts in accordance with Item 449, "Anchor Bolts."

After the traffic signal pole assembly is plumb and all nuts are tight, tack weld each anchor bolt nut in 2 places to its washer. Tack weld each washer to the base plate in 2 places. Never weld components to the bolt. Tack weld in accordance with Item 441, "Steel Structures." After tack welding, repair galvanizing damage on bolts, nuts, and washers in accordance with Section 445.3.5., "Repairs."

Do not grout between the base plate and the foundation.

- 3.4. **Relocation.** Disconnect and isolate traffic signal cables before removing the pole. Remove existing traffic signal pole assemblies as directed. Ensure the poles or attached components suffer no undue stress or damage. Signs, signal heads, mounting brackets, luminaires, etc., may be left on the poles. Repair or replace damaged components as directed.

Remove abandoned concrete foundations, including steel, to a point 2 ft. below final grade unless otherwise shown on the plans. Cut off and remove steel protruding from the remaining concrete. Backfill the hole with materials equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

Move existing pole assemblies to locations shown on the plans, or as directed. Construct foundations for relocated traffic signal pole assemblies in accordance with Item 416, "Drilled Shaft Foundations," and the details shown on the plans. Install existing pole assemblies on new foundations in accordance with Section 686.3.3., "Installation."

Accept ownership of unsalvageable materials and dispose of in accordance with federal, state, and local regulations.

4. MEASUREMENT

This Item will be measured by each traffic signal pole assembly installed or relocated.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Install Traffic Signal Pole Assemblies (Steel)" of the types and sizes specified or "Relocate Traffic Signal Pole Assemblies (Steel)" of the types specified.

New drilled shaft foundations will be paid for under Item 416, "Drilled Shaft Foundations."

- 5.1. **Installation.** This price is full compensation for furnishing, fabricating, galvanizing, assembling, and erecting the pole upon a foundation; furnishing and erecting required mast arms and luminaire arms; furnishing and placing anchor bolts, nuts, washers, and templates; and materials, equipment, labor, tools, and incidentals.
- 5.2. **Relocation.** This price is full compensation for removing traffic signal pole assemblies; removing existing foundations; backfilling and surface placement; storing the components to be reused or salvaged; furnishing, fabricating, and installing required new components including anchor bolts, nuts, washers, and templates; placing and securing traffic signal pole assemblies on new foundations; furnishing and placing conduit, ground rods, and wiring; disposal of unsalvageable materials; loading and hauling; and materials, equipment, labor, tools, and incidentals.

Item 687

Pedestal Pole Assemblies



1. DESCRIPTION

- **Installation.** Furnish and install pedestal pole assemblies for vehicle and pedestrian signals.
- **Relocation.** Remove and relocate existing pedestal pole assemblies.
- **Removal.** Remove existing pedestal pole assemblies.

2. MATERIALS

Furnish new materials in accordance with the following Items and with details shown on the plans:

- Item 445, "Galvanizing"
- Item 449, "Anchor Bolts"
- Item 656, "Foundations for Traffic Control Devices"

- 2.1. **Pedestal Pole Base.** Provide prequalified pedestal pole bases from the Department's MPL in accordance with [DMS-11140](#), "Pedestal Pole Base."
- 2.2. **Pedestal Pole.** Provide 4-in. diameter schedule 40 steel pipe or tubing, aluminum pipe (alloy 6061 T6), or rigid metal conduit. Do not use aluminum conduit. Galvanize pedestal pole assemblies in accordance with Item 445, "Galvanizing," unless otherwise shown on the plans.
- 2.3. **Pedestrian Push Button Pole Assembly.** Provide diameter as shown on the plans, schedule 40 steel pipe or tubing, aluminum pipe (alloy 6061-T6), or rigid metal conduit. Do not use aluminum conduit. Galvanize pedestrian push button post in accordance with Item 445, "Galvanizing," unless otherwise shown on the plans.

3. CONSTRUCTION

Install foundations in accordance with Item 656, "Foundations for Traffic Control Devices."

- 3.1. **Pedestal Pole Base.** Ground the base with connectors to the 1/2-13 NC female threaded hole. Fabricate the base for 4 L bend anchor bolts arranged in a square pattern with a 12-3/4 in. bolt circle. Provide mild steel anchor bolts in accordance with Item 449, "Anchor Bolts," for each base. Provide three 1/16-in. thick and three 1/8-in. thick U-shaped galvanizing steel shims for each base. Size shims to fit around the anchor bolts.
- 3.2. **Installation.** Install pedestal pole assemblies and pedestrian push button post assemblies as shown on the plans, or as directed. Pedestal pole assemblies include foundation, pole shaft, base, anchor bolts, anchor bolt nuts, anchor bolt template, shims, and miscellaneous components. Watertight breakaway electrical disconnects are required for pedestal pole assemblies used in conjunction with vehicle and pedestrian heads and components. Pedestrian push button post assemblies include foundation, pole, and post cap.
- Use established industry and utility safety practices to erect assemblies near overhead or underground utilities. Consult with the appropriate utility company before beginning such work.
- Repair damaged galvanizing in accordance with Section 445.3.5., "Repairs."
- 3.3. **Relocation.** Disconnect and isolate the electrical power supply before removal of the assembly. Remove existing assembly as directed. Salvage existing components such as signs, heads, buttons, pole, and base unless otherwise directed. Repair or replace lost or damaged components as directed.

Install foundations in accordance with Item 656, "Foundations for Traffic Control Devices."

Relocate existing assembly to the location shown on the plans or as directed. Install existing assembly at new foundations in accordance with Section 687.3.2., "Installation." Remove existing foundations in accordance with Section 687.3.4., "Removal." Accept ownership of unsalvageable materials, as determined by the Engineer, and dispose of in accordance with federal, state, and local regulations.

Repair galvanizing for any damaged steel part or any steel part welded after galvanizing in accordance with Item 445, "Galvanizing."

- 3.4. **Removal.** Disconnect and isolate electrical power supplies before removal of the assembly. Remove existing sign panel, beacons, pole, and base from existing assembly. Store items to be reused or salvaged without damaging them. Store sign panels above the ground in a vertical position at locations shown on the plans or as directed. Accept ownership of unsalvageable materials and dispose of in accordance with federal, state, and local regulations.

Disconnect and remove conductors from abandoned circuits. Remove abandoned conduit and ducts to a point 6 in. below final grade. Destroy existing transformer bases to prevent reuse. Remove abandoned foundations to 2 ft. below the finished grade unless otherwise shown on the plans. Cut off and remove steel protruding from the remaining concrete. Backfill the remaining hole with material equal in composition and density to the surrounding area. Replace any surfacing with like material to equivalent condition.

- 3.5. **Painted Finish.** When required, paint pedestal pole and pedestrian push button post assemblies in accordance with details shown on the plans.

4. MEASUREMENT

This Item will be measured by each pedestal pole assembly or each pedestrian push button post assembly installed, relocated, or removed.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Install Pedestal Pole Assembly," "Install Pedestrian Push Button Post Assembly," "Relocate Pedestal Pole Assembly," "Relocate Pedestrian Push Button Post Assembly," "Remove Pedestal Pole Assembly" or "Remove Pedestrian Push Button Post Assembly."

New signal heads will be paid for under Item 682, "Vehicle and Pedestrian Signal Heads."

- 5.1 **Installation.** This price is full compensation for furnishing and installing the shaft; base, shims, anchor bolts, and foundation; and materials, equipment, labor, tools, and incidentals.
- 5.2 **Relocation.** This price is full compensation for removing the pedestal pole or pedestrian push button assemblies; removing existing foundations; installing new foundations; furnishing, fabricating, and installing any new components as required and replacing the assembly on its new foundations with all manipulations and electrical work; controller; salvaging; disposal of unsalvageable material; loading and hauling; and equipment, material, labor, tools, and incidentals.
- 5.3 **Removal.** This price is full compensation for removing the various pedestal pole assemblies components; removing the foundations; storing the components to be reused or salvaged; disposal of unsalvageable material; backfilling and surface placement; loading and hauling; and equipment, materials, tools, labor, and incidentals.

Item 688

Pedestrian Detectors and Vehicle Loop Detectors



1. DESCRIPTION

Furnish and install traffic signal detectors.

2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 618, "Conduit"
- Item 624, "Ground Boxes"
- Item 682, "Vehicle and Pedestrian Signal Heads"
- Item 684, "Traffic Signal Cables"

- 2.1. **Pedestrian Detectors.** Supply housing or an adapter (saddle) that conforms to the pole shape, fitting flush to ensure a rigid installation. Supply adapters of the same material and construction as the housing. Supply push-button switches that have single-pole, single-throw contacts and screw-type terminals and have a design life of at least 1 million operations.

Ensure the internal components provide a push-button with normal open contacts, and include all electrical and mechanical parts required for operation. Ensure the push-button assembly is weather-tight and tamperproof, is designed to prevent an electrical shock under any weather condition, and has provisions for grounding in accordance with the NEC.

- 2.1.1. **Standard Pedestrian Detectors.** Provide a 2-piece cast aluminum housing unit consisting of a base housing and a removable cover. Provide threaded holes for 0.5-in conduit in the housing for any necessary conduit attachment.

Ensure the manufacturer's name or trademark is located on the housing.

- 2.1.2. **Accessible Pedestrian Signals (APS).** Provide accessible pedestrian detectors in accordance with [DMS-11132](#), "Accessible Pedestrian Signals (APS)."

- 2.2. **Vehicle Loop Detectors.** Use stranded copper No. 14 AWG XHHW cross-linked-thermosetting-polyethylene-insulated conductor rated for 600 volts AC for vehicle detector loop wire unless otherwise shown on the plans. Ensure each length of wire shows the name or trademark of the manufacturer, insulation voltage rating, wire gauge, and insulation type at approximate 2-ft. intervals on the insulation surface.

When shown on the plans, use flexible vinyl or polyethylene tubing with 0.184 in. minimum inside diameter, 0.031 in. minimum wall thickness, 0.26 in. maximum outside diameter, and a smooth bore. Use tubing that does not adhere to the loop wire in any way and is capable of resisting deterioration from oils, solvents, and temperatures up to 212°F. Use tubing that is abrasion-resistant and remains flexible from -22°F to 212°F. Use orange or red tubing unless otherwise shown on the plans.

Use sealant for the vehicle detector loops in accordance with [DMS-6340](#), "Vehicle Loop Wire Sealant."

3. CONSTRUCTION

3.1. Pedestrian Detectors.

- 3.1.1. **Push-Button Unit.** Meet the requirements of the TMUTCD when installing push-buttons. Wire the push-button according to manufacturer's installation instructions. Close unused housing openings with a weather-tight closure painted to match the housing. Verify that each button is communicating and fully functional.

Do not use terminal connections or splice wire leads except at approved locations. All allowed splices must be watertight.

Attach wires to terminal posts with solderless terminals unless otherwise advised by manufacturer's recommendations. Attach terminals to the wires with a ratchet-type compression crimping tool properly sized to the wire.

Mount a pedestrian push button sign near each push button as shown on the plans.

For installations where APS buttons are placed less than 10 ft. apart from one another, program the appropriate speech walk message (include the name of the appropriate street in the message) for these buttons. When 2 APS buttons are installed on the same pole ensure that the APS buttons are insulated to eliminate vibrations from traveling to the other button.

- 3.1.2. **Controller Unit.** If a controller unit is required by the plans, integrate the pedestrian controller unit into the traffic signal controller cabinet assembly.

- 3.2. **Vehicle Loop Detectors.** Provide the loop location, configuration, wire color, and number of turns shown on the plans. Loops may be adjusted by the Engineer to fit field conditions.

- 3.2.1. **Saw-Cuts.** Cut the pavement with a concrete saw to form neat lines. Do not exceed 1 in. depth on concrete bridge slab saw-cuts. Cut all other saw-cuts deep enough to provide a minimum of 1 in. depth of sealant over the wire. Make a separate saw-cut from each loop to the edge of the pavement unless otherwise shown on the plans. Ensure the cut is clean and dry when the wire and sealant are placed.

- 3.2.2. **Conduit.** Place conduit between the pavement and ground box as shown on the plans.

- 3.2.3. **Loop Wire Color.** Use the following color code unless otherwise shown on the plans. Use white for the first loop on the right followed by black, orange, green, brown, and blue. Use the same color for all loops in the same lane. Loops installed in multi-lanes will have the same color code in the order the loops are installed. When facing the same direction that traffic flows, the color code will read from right to left for all lanes carrying traffic in that direction. If traffic moves in 2 directions, the color code will be repeated for the other direction of traffic.

- 3.2.4. **Loop Wire Installation.** When shown on the plans, place the loop wire in a flexible vinyl or polyethylene tubing in accordance with Article 688.2., "Materials." The loop wire color requirements do not apply to wires in tubing.

Twist the wire from the loop to the ground box a minimum of 5 turns per foot. When only one pair of wires is in a saw-cut, it need not be twisted while in the saw-cut. Do not splice loop wire in the loop or in the run to the ground box.

Hold the loop wire in place every 2 ft. with strips of rubber, neoprene flexible tubing, or polyethylene foam sealant approximately 1 in. long. Leave these strips in place and fill the slot with loop sealant.

Splice the loop lead-in cable and loop detector wires only in the ground box near the loop it is serving. Use non-corrosive solder for splices and ensure the splice is watertight. Ground the drain wire of the loop lead-in

cable to earth ground only at the controller or detector cabinet. Ensure the resistance from the drain wire to the ground rod is less than 1 ohm.

4. MEASUREMENT

This Item will be measured by the foot of saw-cut containing loop wire and each pedestrian push-button and controller unit.

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

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Vehicle Loop Detectors" of the type specified, "Pedestrian Detector Push-button Units" of the type specified or "Pedestrian Detector Controller Unit." This price is full compensation for furnishing, installing, and testing the detectors, detector controller units, including detector configuration devices or software (when applicable); saw-cutting, excavation, backfill, sealant, and sealant placement; pavement repair associated with saw-cutting; and materials, equipment, labor, tools, and incidentals, except as follows.

The conduit and loop wire from the edge of pavement to the ground box used for the vehicle loop detectors will not be measured or paid for directly but will be subsidiary to this Item.

New ground boxes will be paid for under Item 624, "Ground Boxes." New loop lead-in cable will be paid for under Item 684, "Traffic Signal Cables."

Special Specification 6007

Intelligent Transportation System (ITS) Fiber Optic Cable



1. DESCRIPTION

Furnish, install, relocate and remove Intelligent Transportation System (ITS) fiber optic cable, fiber patch panels and splice enclosures as shown on the plans.

2. MATERIALS

- 2.1. **General Requirements.** Provide, assemble, fabricate and install materials that are new, corrosion resistant, and in accordance with the details shown on the plans and in these Specifications.

Furnish, install, splice, and test all new fiber optic cable. Provide all splicing kits, fiber optic cable caps, connectors, moisture or water sealants, terminators, splice trays, fiber optic jumpers, pig tails, fiber patch panels, fiber interconnect housing, and accessories necessary to complete the fiber optic network. Provide all equipment necessary for installation, splicing, and testing.

- 2.2. **Cable Requirements.** Furnish all-dielectric, dry-filled, gel-free, loose tube fiber optic cable, with low water peak, suitable for underground conduit environments or aerial applications.

Furnish self-supporting, all-dielectric, dry-filled, gel-free, loose tube fiber optic cable, with low water peak suitable for aerial applications when not lashing to strand cable.

All fiber optic cable furnished must have a design life of 20 yr. when installed to the manufacturer's specifications.

Splice fiber optic cables in ground boxes, field cabinets, or buildings. Terminate fiber optic cables in field cabinets and buildings that comply with the details shown on the plans and in this Specification.

Provide all fiber optic cable from the same manufacturer and the manufacturer is International Organization for Standardization (ISO) 9001 certified. Ensure the cables meet or exceed United States Department of Agriculture Rural Utilities Service (RUS) CFR 1755.900, American National Standards Institute/Insulated Cable Engineers Association (ANSI/ICEA) S-87-640, and Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA)-492-CAAB standard.

- 2.3. **Optical Requirements.**

- 2.3.1. **Optical Fiber.** Provide ITU G.652 single mode fiber optic cable with a core diameter of 8.3 ± 0.7 microns and a cladding diameter of 125 ± 0.7 microns. Provide optical fiber made of glass consisting of a silica core surrounded by concentric silica cladding, free of imperfections and inclusions.

- 2.3.2. **Core/Clad Concentricity.** Provide an offset between the center of the core and cladding less than 0.5 microns.

- 2.3.3. **Mode Field Diameter.** Provide single mode fiber optic cable with the effective area or Mode Field Diameter of the fiber must be $9.2 \pm 0.4 \mu\text{m}$ at 1310 nm and $10.5 \pm 1.0 \mu\text{m}$ at 1550 nm.

- 2.3.4. **Primary Coating.** Provide fiber with a coating diameter of 250 ± 15 microns.

- 2.3.5. **Attenuation.** Provide single mode fiber optic cable with nominal attenuation of 0.35 dB/km maximum at a wavelength of 1310 nm and nominal attenuation of 0.25 dB/km maximum at a wavelength of 1550 nm.
- Attenuation at water peak must be less than 0.35 dB/km at 1383 nm.
- 2.3.6. **Bandwidth and Dispersion.** Provide single mode fiber optic cable with a maximum dispersion of:
- 3.2 ps/nm-km at a wavelength of 1310 nm, and
 - 18 ps/nm-km at a wavelength of 1550 nm.
- Zero dispersion wavelength must be between 1300 nm and 1324 nm and the zero dispersion slope at the zero dispersion wavelength must be less than 0.092 ps/(nm² · km).
- The cutoff wavelength must be less than 1260 nm for single mode fibers specified to operate at 1310 nm. The cutoff wavelength must be less than 1480 for single mode fibers specified to operate only at 1550 nm or higher.
- The macrobend attenuation per 100 turns must not exceed 0.05 dB at 1310 nm and 1550 nm.
- 2.3.7. **Mechanical Requirements(Tensile Strength).** Provide a cable withstanding a pulling tension of 600 lbf without increasing attenuation by more than 0.8 dB/mi when installing in underground conduit systems in accordance with EIA-455-33A. Conduct an impact test in accordance with TIA/EIA-455-25C (FOTP-25) and a compression load test in accordance with TIA/EIA-455-41A (FOTP-41).
- For all-dielectric self-supporting cable (ADSS) and other self-supporting cables, meet tensile strength requirements in accordance with Section 25, Loading of Grades B and C, of National Electric Safety Code (NESC), for the maximum span and sag information as shown in the plans for aerial construction.
- 2.3.8. **Bend Radius.** Provide a cable withstanding a minimum bending radius of 10 times its outer diameter during operation, and 20 times its outer diameter during installation, removal and reinstallation without changing optical fiber characteristics. Test the cable in accordance with EIA-455-33A.
- 2.3.9. **Buffering.** Use a buffering tube or jacket with an outer diameter of 1.0 to 3.0 mm containing 12 individual fiber strands. The fibers must not adhere to the inside of the buffer tube.
- 2.3.10. **Color Coding.** Provide fiber and buffer tubes with a color coating applied to it by the manufacturer. Coating must not affect the optical characteristics of the fiber. Provide color configuration in accordance with TIA/EIA-598 as follows:
- | | | |
|-------------|------------|--------------|
| ■ 1. Blue | ■ 5. Slate | ■ 9. Yellow |
| ■ 2. Orange | ■ 6. White | ■ 10. Violet |
| ■ 3. Green | ■ 7. Red | ■ 11. Rose |
| ■ 4. Brown | ■ 8. Black | ■ 12. Aqua |

3. EQUIPMENT

- 3.1. **Cable Type.** Provide cables with a reverse oscillation or planetary stranding structure.

Jacket construction and group configuration should separate at splice points to cut and splice 1 set of fibers while the others remain continuous. All cable jackets must have a ripcord to aid in the removal of the outer jacket. Submit cable designs for approval.

Strand loose buffer tubes around a dielectric central anti-buckling strength member. Provide dielectric aramid or fiber glass strength members with specified strength for the cable. Provide cable with a water-blocking material, which is non-hygroscopic, non-nutritive to fungus, non-conductive, non-toxic, and homogeneous. The water blocking material must comply with TIA/EIA-455-81B and 455-82B as well as TIA/EIA-455-98.

Ensure a polyethylene inner jacket is applied over the cable core, and that the entire cable is enclosed with a polyethylene outer jacket. Ensure the outer jacket contains black carbon to provide UV protection for the cable. Ensure each cable is marked with the manufacturer's name, the date of manufacture (month/year), the fiber count (example 48F SM), and sequential length markings at maximum 2 ft. increments, measured in U.S. units.

For aerial installation, provide standard fiber optic cable lashed to steel messenger cable or ADSS in accordance with the Institute of Electrical and Electronics Engineers (IEEE) 1222 Standard for Testing and Performance for All-Dielectric Self-Supporting (ADSS) Fiber Optic Cable for Use on Electric Utility Power Lines, or most current version. Provide ADSS cable in accordance with the maximum span distance, weather load rating, and allowable sag as shown on the plans. "Figure 8" self-supporting cable with integrated messenger cable within the outer jacket for aerial installation is acceptable.

3.1.1. **Cable Size.** Furnish cables with a maximum diameter not exceeding 19 mm.

3.1.2. **Environmental Requirements.** Provide cable that functions in a temperature range from -40°F to 158°F.

3.2. **Fiber Optic Accessories.**

3.2.1. **Splice Enclosures.** Furnish and install 1 of 3 types of underground splice enclosures at locations shown on the plans to accommodate the cables being spliced at that point. The types are as follows:

- Type 1: 4 cable entry ports total – 2 ports to accommodate backbone fiber of up to 144 fibers and 2 ports for drop cables of up to 48 fibers,
- Type 2: 6 cable entry ports total – 4 to accommodate backbone or arterial cables of up to 144 fibers and 2 ports for drop cables of up to 48 fibers, and
- Type 3: 8 cable entry ports total – 4 to accommodate backbone or arterial cables of up to 144 fibers and 4 ports for drop cables of up to 48 fibers.

Provide the end cap of the canister splice closure with re-enterable quick-seal cable entry ports to accommodate additional branch cables or backbone cables. Provide fiber optic splice enclosures with strain relief, splice organizers, and splice trays from the same manufacturer as the splice enclosure. Select the appropriate splice enclosure type based on the number of splices called for in the plans. Suspend all splice closures off floor of the ground box and secure to cable rack assembly on side wall of ground box.

For end of reel splicing, use a fiber optic splice enclosure sized to accommodate full cable splice in one enclosure. Fiber optic splice enclosure must be of the same manufacturer as other supplied on a project. Splice enclosure and fusion splicing required for end of reel will be incidental to the fiber optic cable.

Comply with the Telcordia Technologies' GR-711-CORE standard and all applicable NEC requirements.

Contain all optical fiber splices within a splice enclosure, providing storage for fiber splices, nonspliced fiber, and buffer tubes. Provide sufficient space inside the enclosure to prevent microbending of buffer tubes when coiled.

Ensure that the splice enclosure maintains the mechanical and environmental integrity of the fiber optic cable, encases the sheath opening in the cable, and organizes and stores optical fiber. Ensure all hinges and latching devices are stainless steel or of a non-corrosive material designed for harsh environments. Ensure that the enclosure is airtight and prevents water intrusion. Ensure that splice enclosures allow re-entry and are hermetically sealed to protect internal components from environmental hazards and foreign material such as moisture, dust, insects, and UV light.

3.2.2. **Field Rack Mount Splice Enclosures.** Provide a 19 in. EIA rack mounted splice enclosure module to hold spliced fibers as shown in the plans inside field equipment cabinets or buildings.

Splice or terminate fibers inside rack mounted fiber optic splice enclosures. Provide an enclosed unit designed to house a minimum of 4 cables, sized to accommodate at a minimum the cables shown on the plans plus future expansion.

Provide splice enclosures containing mounting brackets with a minimum of 4 cable clamps. Install cable according to manufacturer recommendations for the cable distribution panel.

3.2.3. **Fiber Patch Panels.** Provide fiber patch panels that are compatible with the fiber optic cable being terminated and color coded to match the optical fiber color scheme. Coil and protect a maintenance loop of at least 5 ft. of buffer tube inside the rack mount enclosure, patch panel, or splice tray. Allow for future splices in the event of a damaged splice or pigtail.

3.2.3.1. **Cabinet.** Terminate or splice fibers inside the compact and modular fiber patch panel in the cabinet. Provide fiber patch panel for installation inside a 19 in. EIA rack and sized appropriately to accommodate the fiber terminations shown on the plans or as directed by the Engineer. Provide each patch panel housing with pre-assembled compact modular snap-in simplex connector panel modules, each module having a minimum of 6 fiber termination/connection capabilities. Provide modules with a removable cover having 6 pre-connectorized fiber pigtails, interconnection sleeves, and dust caps installed by the manufacturer. Provide a 12 fiber or greater fusion splice tray capability housing, each tray holding 12 fusion splices as shown in the plans. Stack splice trays on a rack to permit access to individual trays without disturbing other trays. Locate splice trays in a rack within a pull-out shelf. Protect the housing with doors capable of pivoting up or down. Document the function of each terminated/spliced fiber, along with the designation of each connector on labels or charts located either on the inside or outside of the housing door. Provide labels or charts that are UV resistant design for harsh environments and used inside field equipment cabinets. Use permanent marker or method of identification that will withstand harsh environments. Provide each housing with strain relief. Terminate single mode fiber optic cable with SC connectors to the patch panels, unless otherwise shown on the plans.

Install the fiber patch panel as an integral unit as shown on the plans.

3.2.3.2. **Building.** Provide a fiber patch panel with a modular design allowing interchangeability of connector panel module housing and splice housing within the rack, as shown on the plans.

Provide the number of single mode fibers, connector panel module housings, and splice housings for the patch panel unit in the building as shown on the plans.

Provide a fiber patch panel unit, installed at a height less than 7 ft., capable of housing 8 connector panel module housings or 8 splice housings. Protect the housing with doors capable of pivoting up or down and sliding into the unit.

Provide 12 snap-in simplex connector panel modules with each connector panel module housing, each module having 6 fiber termination/connector capabilities. Use a pre-assembled compact modular unit with a removable cover for the snap-in simplex connector panel module having 6 pre-connectorized fiber pigtails, interconnection sleeves, and dust caps installed by the manufacturer. Provide each connector panel module housing with a jumper routing shelf, storing up to 5 ft. (minimum) of cable slack for each termination within the housing. Provide the fiber distribution unit with strain relief.

Provide splice enclosure with 24 fusion splice tray capabilities, each splice tray holding 12 or more fusion splices. Stack splice trays on a rack to permit access to individual trays without disturbing other trays. Locate the rack on a pull-out shelf.

Document the function of each terminated/spliced fiber, along with the designation of each connector on labels or charts located either on the inside or outside of the housing door. Provide labels or charts that are UV resistant design for harsh environments and used inside field equipment cabinets. Use permanent marker or method of identification that will withstand harsh environments. Also provide documentation of the function of each terminated or spliced fiber along with the designation of each connector on charts or

diagrams matching the fiber patch panel configuration and locate inside cabinet document drawer. Provide documentation at the conclusion of fiber terminations and splicing.

Allow terminations only in the fiber interconnect housings placed in the cabinets as shown on the plans or as directed.

- 3.2.4. **Splice Trays.** Use splice tray and fan-out tubing kit for handling each fiber. Provide a splice tray and 12 fiber fan-out tubing with each housing for use with the 250 microns coated fiber. The fan-out will occur within the splice tray (no splicing of the fiber required). Allow each tube to fan out each fiber for ease of connectorization. Label all fibers in splice tray on a log sheet securing it to the inside or outside of the splice tray. Provide UV resistant log sheet suitable for harsh environments, located inside field cabinets or splice enclosures. Provide fan-out tubing with 3 layers of protection consisting of fluoropolymer inner tube, a dielectric strength member, and a 2.9 mm minimum outer protective PVC orange jacketing.
- 3.2.5. **Jumpers.** Provide fiber optic jumper cables to cross connect the fiber patch panel to the fiber optic transmission equipment as shown on the plans or as directed. Match the core size, type, and attenuation from the cable to the simplex jumper. Use yellow jumpers and provide strain relief on the connectors. Provide fiber with a 900 micron polymer buffer, Kevlar strength member, and a PVC jacket with a maximum outer jacket of 2.4 mm in diameter.
- Provide 5 ft. long jumpers, unless otherwise shown on the plans. On the patch panel end of each jumper, provide an SC connector. On the opposite end of the jumper, provide a connector that is suitable to be connected to the fiber optic transmission equipment selected. When providing jumpers for existing equipment, provide connectors suitable to be connected to patch panels and fiber optic transmission equipment in use. All jumpers must have factory terminated connectors. Field terminations of connectors is prohibited.
- 3.2.6. **Fiber Optic Cable Storage Device.** Furnish fiber optic cable storage device designed to store slack fiber optic cable by means of looping back from device to device on an aerial run. Furnish storage devices that are non-conductive and resistant to fading when exposed to UV sources and changes in weather. Ensure storage devices have a captive design such that fiber-optic cable will be supported when installed in the aerial rack apparatus and the minimum bending radius will not be violated. Provide stainless steel attachment hardware for securing storage devices to messenger cable and black UV resistant tie-wraps for securing fiber-optic cable to storage device. Provide tie-wraps that do not damage fiber when securing to storage device. Ensure storage devices are stackable so multiple cable configurations are possible. Ensure cable storage devices furnished are compatible with the type of aerial cable furnished and installed. Aerial cable storage devices will be considered incidental to the installation of the fiber optic cable.

4. CONSTRUCTION

Install fiber optic cable in accordance with United States Department of Agriculture Rural Utilities Service CFR 1755.900 specifications for underground and aerial plant construction without changing the optical and mechanical characteristics of the cables.

Utilize available machinery, jacking equipment, cable pulling machinery with appropriate tension monitors, splicing and testing equipment, and other miscellaneous tools to install cable, splice fibers, attach connectors and mount hardware in cabinets employed with the above "Mechanical Requirements." Do not jerk the cable during installation. Adhere to the maximum pulling tensions of 600 lbf and bending radius of 20 times the cable diameter or as specified by the manufacturer, whichever is greater.

Use installation techniques and fixtures that provide for ease of maintenance and easy access to all components for testing and measurements. Take all precautions necessary to ensure the cable is not damaged during transport, storage, or installation. Protect as necessary the cables to prevent damage if being pulled over or around obstructions along the ground.

Where plans call for removal of existing cable to salvage or reuse elsewhere, take care to prevent damaging the existing cable during removal adhering to all of the requirements for installation that pertain to removal.

- 4.1. **Packaging, Shipping, and Receiving.** Ensure the completed cable is packaged for shipment on reels. Ensure the cable is wrapped in weather and temperature resistant covering. Ensure both ends of the cable are sealed to prevent the ingress of moisture.

Securely fasten each end of the cable to the reel to prevent the cable from coming loose during transit. Provide 6 ft. of accessible cable length on each end of the cable for testing. Ensure that the complete outer jacket marking is visible on these 6 ft. of cable length. Provide each cable reel with a durable weatherproof label or tag showing the Manufacturer's name, the cable type, the actual length of cable on the reel, the Contractor's name, the contract number, and the reel number. Include a shipping record in a weatherproof envelope showing the above information and also include the date of manufacture, cable characteristics (size, attenuation, bandwidth, etc.), factory test results, cable identification number and any other pertinent information. Ensure that all cable delivered has been manufactured within 6 mo. of the delivery date. Ensure that the minimum hub diameter of the reel is at least 30 times the diameter of the cable. Provide the cable in one continuous length per reel with no factory splices in the fiber. Provide a copy of the transmission loss test results as required by the TIA/EIA-455-61 standard, as well as results from factory tests performed prior to shipping.

- 4.2. **Installation in Conduit.** Install fiber optic cable in conduits in a method that does not alter the optical properties of the cable. If required, relocate existing cable to allow new fiber optic cable routing in conduits.

When pulling the cable, do not exceed the installation bending radius. Use rollers, wheels, or guides that have radii greater than the bending radius. Use a lubricating compound to minimize friction. Use fuse links and breaks to ensure that the cable tensile strength is not exceeded. Measure the pulling tension with a mechanical device and mechanism to ensure the maximum allowable pulling tension of 600 lbf is not exceeded at any time during installation.

Provide a single 1/C #14 XHHW insulated tracer wire in conduit runs where fiber optic cable is installed. Provide cable that is UL listed solid copper wire with orange color low density polyethylene insulation suitable for conduit installation and with a voltage rating of 600V. When more than one fiber optic cable is installed through a conduit run, only one tracer wire is required. Fuse or join tracer wires used in backbone, arterial, and drop runs, so that you have one continuous tracer wire. Terminate tracer wire at fiber optic test markers or equipment cabinets as identified in the plans for access to conduct a continuity test. Tracer wire will be paid for under Item 620, "Electrical Conductors."

Provide flat pull cord with a minimum tensile strength of 1,250 lb. in each conduit containing fiber optic cable. A traceable pull cord, with a metallic conducting material integral to the pull cord, may be substituted for a 1/C #14 tracer wire only with approval from the Department.

Seal conduit ends with a 2 part urethane after installation of fiber optic cable.

- 4.3. **Cable Installation between Pull Boxes and Cabinets or Buildings.** Do not break or splice a second fiber optic cable to complete a run when pulling the cable from the nearest ground box to a cabinet or building. Pull sufficient length of cable in the ground box to reach the designated cabinet or building. Pull the cable through the cabinet to coil, splice, or terminate the cable in the cabinet or building. Do not bend the cable beyond its minimum bend radius of 20 times the diameter.

Coil and tie cable inside cabinet, building, or boxes for future splicing or termination as shown in the plans. Cut off and remove the first 10 ft. of pulled or blown fiber stored. This work is incidental to this Item. Coat the open end of the coiled cable with protective coating and provide a dust cap.

- 4.4. **Aerial Installation.** Use pole attachment hardware and roller guides with safety clips to install aerial run cable. Maintain maximum allowable pulling tension of 600 lb. ft. during the pulling process for aerial run cable by using a mechanical device. Do not allow cable to contact the ground or other obstructions between poles during installation. Do not use a motorized vehicle to generate cable pulling forces. Use a cable suspension

clamp when attaching cable tangent to a pole. Select and place cable blocks and corner blocks so as not to exceed the cable's minimum bending radius. Do not pull cable across cable hangers. Store 100 ft. of fiber-optic cable slack, for future use, on all cable runs that are continuous without splices or where specified on the plans. Store spare fiber optic cable on fiber-optic cable storage racks of the type compatible with the aerial cable furnished. Locate spare cable storage in the middle of spans between termination points. Do not store spare fiber-optic cable over roadways, driveways or railroads.

Install standard cable on timber poles by lashing to steel messenger cable. Provide steel messenger cable in accordance with Item 625, "Zinc Coated Steel Wire Strand." Install all-dielectric self-supporting cable (ADSS) cable on timber poles using clinching clamp with cable hanger. Install aerial run cable in accordance with these specifications and as shown on the plans.

Locate aerial fiber in accordance with the NESC, Section 23, with respect to vertical clearances over the ground, between conductors carried on different supporting structures, and required separation distance of the cable from bridges, buildings, and other structures.

- 4.5. **Blowing Fiber Installation.** Use either the high-air speed blowing (HASB) method or the piston method. When using the HASB method, ensure that the volume of air passing through the conduit does not exceed 600 cu. ft. per min. or the conduit manufacturer's recommended air volume, whichever is more restrictive. When using the piston method, ensure that the volume of air passing through the conduit does not exceed 300 cu. ft. per min. or the conduit manufacturer's recommended air volume, whichever is more restrictive.

- 4.6. **Slack Cable.** Pull and store excess cable slack inside ITS ground boxes as shown on the plans. The following are minimum required lengths of slack cable, unless otherwise directed:

- ground boxes (No Splice) - 25 ft.,
- ground boxes (With Splice) - 100 ft.,
- future splice point - 100 ft., and
- cabinets - 25 ft.

Note that the slack is to be equally distributed on either side of the splice enclosure and secured to cable storage racks within the ground boxes.

Provide proper storage of slack cable, both long term and short term. Neatly bind cables to be spliced together from conduit to splice enclosure with tape. Do not over bind by pinching cable or fiber. Ground and bond the armor when installing armored fiber optic cable. Meet NEC and NESC requirements for grounding and bonding when using armored cable.

- 4.7. **Removal, Relocation and Reinstallation of Fiber Optic Cable.** Remove fiber optic cable from conduit as shown on plans. Use care in removing existing fiber optic cables so as not to damage them. Provide cable removal and reinstallation procedures that meet the minimum bending radius and tensile loading requirements during removal and reinstallation so that optical and mechanical characteristics of the existing cables are not degraded. Use entry guide chutes to guide the cable out of and in to existing or proposed conduit, utilizing lubricating compound where possible to minimize cable-to-conduit friction. Use corner rollers (wheels) with a radius not less than the minimum installation bending radius of cable. Dispose of removed fiber optic cable unless plans show for it to be re-used (relocated/re-installed) or salvaged and delivered to the Department. See plans for details. Test each optical fiber in the cable for performance and for loss at existing terminations or splices prior to cutting and removal. Retest following removal and following re-installation to ensure the removal and reinstallation has not affected the optical properties of the cable. Any fiber optic cable damaged by the contractor that is to be re-used shall be replaced by the contractor at no cost to the Department with new fiber optic cable meeting the approval of the Engineer. The Engineer reserves the right to reject the fiber based on the test results.

Maintain the integrity of existing cables, conduit, junction boxes and ground boxes contiguous to the section of cables to be removed. Replace or repair any cables, conduit, junction boxes or ground boxes damaged during work at the Contractor's expense. The replacement or repair method must be approved by the Engineer, prior to implementation.

- 4.8. **Splicing Requirements.** Fusion splice fibers as shown on the plans, in accordance with TIA/EIA-568 and TIA/EIA-758.

Use fusion splicing equipment recommended by the cable manufacturer. Clean, calibrate, and adjust the fusion splicing equipment at the start of each shift. Use splice enclosures, organizers, cable end preparation tools, and procedures compatible with the cable furnished. Employ local injection and detection techniques and auto fusion time control power monitoring to ensure proper alignment during fusion splicing.

When approaching end of shift or end of day, complete all splicing at the location. Package each spliced fiber in a protective sleeve or housing. Re-coat bare fiber with a protective 8 RTV, gel or similar substance, prior to application of the sleeve or housing.

Perform splices with losses no greater than 0.10 dB. Use an Optical Time Domain Reflectometer (OTDR) to test splices in accordance with Section 4.13.1.1. Record splice losses on a tabular form and submit for approval.

- 4.9. **Termination Requirements.** Provide matching connectors with 900 micron buffer fiber pigtails of sufficient length and splice the corresponding optical fibers in cabinets where the optical fibers are to be connected to terminal equipment. Buffer, strengthen, and protect pre-terminated fiber assemblies (pigtails) with dielectric aramid yarn and outer PVC jacket to reduce mishandling that can damage the fiber or connection. Pigtails must be duplex stranding with a yellow PVC outer jacket. Fiber optic pigtails must be factory terminated with SC connectors, unless otherwise shown on the plans. When providing pigtails for existing equipment, provide connectors suitable to be connected to patch panels and fiber optic transmission equipment in use.

Connectors must meet the TIA/EIA-568 and TIA/EIA-758 standards and be tested in accordance to the Telcordia/Bellcore GR-326-CORE standard. When tested according to TIA/EIA-455-171 (FOTP-171), ensure that the connectors test to an average insertion loss of less than or equal to 0.4 dB and a maximum loss of less than or equal to 0.75 dB for any mated connector. Maintain this loss characteristic for a minimum of 500 disconnections and reconnections with periodic cleanings per EIA-455-21A (FOTP-21). Qualify and accept connectors by the connector-to-connector mating using similar fibers. Ensure that the connector operating range is -40°F to 167°F. Provide connectors with a yellow color body or boot.

Test connections at the patch panel and splices made between cables to pigtails with the OTDR to verify acceptable losses.

Remove 5 ft. of unused optical fibers at the ends of the system from the buffer tube(s) and place coiled fibers into a splice tray. Clean the water blocking compound from all optical fibers destined for splice tray usage.

Install cable tags at all splice points identifying key features of each cable such as cable name or origin and destination and fiber count. Ensure tags are self-laminating or water resistant. Print the information onto the tags electronically or write neatly using a permanent marker. Locate tags just prior to entrance into splice enclosure.

- 4.10. **Mechanical Components.** Provide stainless steel external screws, nuts and locking washers. Do not use self-tapping screws unless approved. Provide corrosion resistant material parts and materials resistant to fungus growth and moisture deterioration.

- 4.11. **Experience Requirements.**

- 4.11.1. **Installing Fiber Optic Cable.** The Contractor or designated subcontractor involved in the installation of the fiber optic cable must meet the experience requirements in accordance with the following:

- minimum of 3 yr. of continuous existence offering services in the installation of fiber optic cable through an outdoor conduit system or aerial and terminating in ground boxes, field cabinets or enclosures or buildings, and

- completed a minimum of 3 projects where the personnel pulled a minimum of 5 mi. in length of fiber optic cable through an outdoor conduit system of aerial for each project. The completed fiber optic cable systems must have been in continuous satisfactory operation for a minimum of 1 yr.

4.11.2. **Splicing and Testing of Fiber Optic Cable.** The Contractor or designated subcontractor involved in the splicing and testing of fiber optic cable must meet the experience requirements in accordance with the following:

4.11.2.1. **Minimum Experience.** 3 yr. continuous existence offering services in the fields of fusion splicing and testing of fiber optic cable installed through a conduit system and terminating in ground boxes, field cabinets or enclosures or buildings. Experience must include all of the following:

- termination of a minimum of 48 fibers within a fiber distribution frame,
- OTDR testing and measurement of end to end attenuation of single mode and multimode fibers,
- system troubleshooting and maintenance,
- training of personnel in system maintenance,
- use of water-tight splice enclosures, and
- fusion splicing of fiber optic cable which meet the tolerable decibel (dB) losses within the range of 0.05 dB – 0.10 dB for single mode.

4.11.2.2. **Completed Projects.** A minimum of 3 completed projects where the personnel performed fiber optic cable splicing and terminations, system testing, system troubleshooting and maintenance during the course of the project and provided training on system maintenance. Each project must have consisted of a minimum 5 mi. of fiber optic cable installed, measured by project length not linear feet of fiber installed. The completed fiber optic cable systems must have been in continuous satisfactory operation for a minimum of 1 yr.

4.12. **Documentation Requirements.** Provide a minimum of 2 complete sets of fiber optic equipment submittal literature documenting compliance with the requirements of this Item including operation and maintenance manuals in hard copy format, bound, as well as an electronic version in Adobe PDF format on a CD/DVD or removable flash drive that includes the following:

- fiber optic cable literature consisting of manufacturer specification and cut sheets,
- fiber optic equipment literature consisting of manufacturer specification and cut sheets for splice enclosures, patch panels, splice trays, jumpers, cable storage devices, and fiber optic labeling devices,
- complete factory performance data documenting conformance with the performance and testing standards referenced in this Item, including pre-installation test results of the cable system,
- installation, splicing, terminating and testing plan and procedures,
- documentation of final terminated or spliced fibers, function, and equipment designation,
- OTDR calibration certificate,
- post-installation, post termination, subsystem, and final end-to-end test results,
- loss budget calculation and documentation,
- complete parts list including names of vendors,
- complete maintenance and trouble-shooting procedures, and
- proof of minimum experience and completed projects.

4.12.1. **Installation Practice.** Submit for approval electronic copy of the Contractors Installation Practices 30 working days prior to installation. Submit installation practices and procedures and a list of installation, splicing and test equipment used. Provide detailed field quality control procedures and corrective action procedures.

4.12.2. **Manufacturer's Certification.** Accompany each reel of fiber optic cable with the manufacturer's test data showing the conformance to the requirements in this Item.

4.12.3. **Test Procedures.** Submit test procedures and data forms for the pre-installation, post-installation, subsystem, final end to end test, and loss budget calculations for approval. Test procedures will require

approval before performing tests. Submit 1 copy data forms containing data and quantitative results, as well as an authorized signature. Submit a copy of the OTDR results as a hard copy or electronic copy in PDF format including all OTDR traces and clearly identifying each event (fusion splice, jumper, connector, etc.) with the measured loss identified.

- 4.13. **Testing.** Perform tests in accordance with testing requirements in this Item, USDA RUS CFR 1755.900, and TIA/EIA-455-61 test specifications. For all tests, provide test forms to be used that compare measured results with threshold values.

4.13.1. **Test Methods.**

- 4.13.1.1. **Optical Time Domain Reflectometer (OTDR) Tests.** Use the OTDR to measure fiber optic cable for overall attenuation (signal loss dB/km), fiber cable length, and identify fiber optic cable anomalies such as breaks. Perform the following 4 OTDR tests:

- pre-Installation test (Acceptance test),
- post installation test,
- post termination test, and
- final end to end test.

OTDR Settings:

- generate a file name for each OTDR scan. The file name must indicate the location or direction the test was run from, as well as the fiber number being tested,
- set the "A" cursor at the beginning of the fiber trace and set the "B" cursor at the end of the fiber trace. The distance to cursor "B" indicates the length of the fiber cable segment being measured,
- match the index of refraction to the index of the factory report,
- set the loss indicator to dB/km for the acceptance test,
- the reflectance is automatically set internally by the OTDR,
- set the pulse width at a medium range. Change the pulse width to a slow pulse width when an anomaly occurs on the fiber trace so that it can be examined closely,
- set the average at medium speed. Change the average to slow when an anomaly appears on the fiber trace to allow for closer examination of the anomaly, and
- set wavelength at 2 windows for single mode cable: 1310 nm and 1550 nm.

Provide the current OTDR calibration certificate for the device used, showing the unit has been calibrated within the last year. Show all settings on test result fiber scans.

- 4.13.1.2. **Pre-installation Tests.** Test and record the fiber optic cable at the site storage area prior to installation.

Conduct bi-directional OTDR tests for each fiber strand. Test each optical fiber in the cable from one end with an OTDR compatible with wavelength and fiber type. Check testing for length, point discontinuity, and approximate attenuation. Record each measurement by color, location, and type of fiber measured. Perform a measurement from the opposite end of that fiber in case a measurement cannot be made from one end. Wait for notification if loss per kilometer exceeds manufacturer's test data by more than 0.5 dB/km or point discontinuity greater than 0.05 dB.

Perform this test within 5 days from receipt of the fiber optic cable. Test overall attenuation (dB/km), total cable length, anomalies, and cable problems. Test cable at both wavelengths (1310 nm and 1550 nm for single mode cable). Verify that the cable markings on the outer jacket are within 1% of the total cable length.

Compare factory test results with test results and return to manufacturer if test results are not identical to factory test results. If identical, document the test results. Deliver documentation for future reference.

- 4.13.1.3. **Post-installation Tests.** Re-test and re-record each optical fiber in the cable after installation, before termination, for loss characteristics. Test both directions of operations of the fiber.

Immediately perform the post installation test after the fiber optic cable has been installed. Test cable for overall attenuation, cable segment length, and evidence of damage or microbend with the OTDR. Replace any cable segment that is damaged during the test and document test results. Submit test results for approval.

Use the same OTDR settings for Post-Installation Tests as the Pre-Installation Tests.

4.13.1.4. **Post Termination Tests.** Perform the post termination test after the cable is terminated or spliced, including termination of fiber cable to fiber cable or fiber cable to fiber pigtail and fiber cable to patch panels. Check attenuation, fusion or termination point problems, and overall fiber cable segment. Determine if the attenuation and quality of the termination complies with these Specifications; if not, re-terminate the fiber and re-test until the Specification requirements are met. Test the fiber segment for attenuation and anomalies after termination acceptance. Document and submit test results after fiber segment acceptance.

4.13.1.5. **Subsystem Tests.** Perform network subsystem tests after integration to the fiber optic network. Test the capability of the fiber optic cable to transmit video and digital information from node to node. A node is defined as a communication cabinet, hub cabinet, surveillance cabinet, or hub building where network hub switches are located. Complete and submit approved data forms for approval.

Correct and substitute components in the subsystem if the subsystem tests fail and repeat the tests. Components may include: cable, jumper, patch panel module, or connector.

Prepare and submit a report if a component was modified as result of the subsystem test failure. Describe in the report the failure and action taken to remedy the situation.

4.13.1.6. **Final End-to-End Test.** Perform final end to end Test after fiber cable segments of the system are terminated using the OTDR and an optical Power Meter and Light Source (PMLS).

Perform the Part 1 of the final end to end test using OTDR:

- measure the overall fiber cable system length,
- measure the overall system attenuation, and
- check for anomalies.

Perform the Part 2 of the final end to end test using a PMLS:

- measure the absolute power of the fiber optic signal across all links, and
- check for anomalies.

Document and submit results after test acceptance.

4.13.2. **Loss Budget Calculation and Documentation.** Calculate the total loss budget of the system according to the following calculations and compare the actual loss in each segment of the system to the calculated budget. Submit the results for each section of fiber optic cable in tabular format reporting if the total loss is within the limits of these Specifications by noting "pass" or "fail" for each segment of fiber. A segment of fiber is defined as one that terminates at each end. Use the following calculations to determine the loss budget for each segment:

- splice loss budget = number of splices x 0.1 dB/splice,
- connector loss budget = number of connectors x 0.75 dB/connector,
- length loss budget = length of fiber optic cable (measured by OTDR) x 0.35 dB/km for 1310 nm wavelength or 0.25 dB/km for 1550 nm wavelength, and
- total Loss Budget = splice loss budget + connector loss budget + length loss budget.

Provide loss budget calculation equations on test form to be submitted as part of the documentation requirements. Provide threshold calculations described above along with measured results.

- 4.14. **Training.** Conduct a BISCO or IMSA certified training class (minimum of 16 hr.) for up to 10 representatives designated by the Department on procedures of installation, operations, testing, maintenance and repair of all equipment specified within this specification. Submit to the Engineer for approval, 10 copies of the training material at least 30 days before the training begins. Conduct training within the local area unless otherwise authorized by the Engineer Include the following training material:
- NESC, NEC, and ANSI/TIA 590 code compliance,
 - fiber optic cable pulling and installation techniques,
 - use of installation tools,
 - splicing and terminating equipment and test instruments,
 - trouble shooting procedures, and
 - methods of recording installation and test data.
- 4.15. **Warranty.** Provide a warranty for all materials furnished in this Item. Ensure that the fiber optic cable, the splice enclosures, splice centers, and cable markers have a minimum of a 2 yr. manufacturer's warranty and that 95% of that warranty remains at the date of final acceptance by the Engineer. If the manufacturer's warranties for the components are for a longer period, those longer period warranties will apply. Guarantee that the materials and equipment furnished and installed for this project performs according to the manufacturer's specifications.

Ensure that the manufacturer's warranties for off-the-shelf equipment consisting of splice enclosures, splice trays, connectors, fiber jumper cables, and fiber patch panels are fully transferable from the Contractor to the Department. Ensure that these warranties require the manufacturer to furnish replacements for any off-the-shelf part or equipment found to be defective during the warranty period at no cost to the Department within 10 calendar days of notification by the Department.

Ensure that the manufacturer's warranty for fiber optic cable is fully transferable from the Contractor to the Department. Ensure that the warranty requires the manufacturer to furnish replacement fiber optic cable found to be defective during the warranty period at no cost to the Department within 45 calendar days of notification by the Department.

5. MEASUREMENT

Fiber optic cable installed, relocated and removed will be measured by the linear foot. Fiber optic splice enclosures, rack mounted splice enclosures and fiber optic patch panels will be measured by each unit installed. Splicing of Fiber Optic Cables will be measured by each fusion splice performed.

6. PAYMENT

6.1. Furnish and Install.

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 "Fiber Optic Cable" of the various types, and number of fibers specified. This price is full compensation for furnishing and installing all cable; for pulling through conduit or duct; aerial installation; terminating; testing; and for materials, equipment, labor, tools, documentation, warranty, training and incidentals.

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 "Fiber Optic Splice Enclosure" of the various types and "Rack Mounted Splice Enclosure." This price is full compensation for furnishing and installing all enclosures whether aerial, underground, in cabinet or in building; and for materials, equipment, labor, tools, documentation, warranty, training and incidentals.

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 "Fiber Optic Fusion Splice" for each fusion splice

shown on the plans and performed. This price is full compensation for splicing; testing; and for materials, equipment, labor, tools, documentation, warranty, training and incidentals.

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 "Fiber Patch Panel" of the various types and sizes specified. This price is full compensation for furnishing and installing all patch panels and terminating fibers on the panel as shown on the plans; and for materials, equipment, labor, tools, documentation, warranty, training and incidentals.

Conduit will be paid for under Item 618, "Conduit" and Special Specification 6016, "ITS Multi-Duct Conduit."

Electrical conductors will be paid for under Item 620, "Electrical Conductors."

- 6.2. **Install Only.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit bid price for "Fiber Optic Cable (Install Only)" of the various types, and number of fibers specified. This price is full compensation for installing fiber optic cable furnished by the Department; for pulling through conduit or duct; aerial installation; terminating; testing; and for materials, equipment, labor, tools, documentation, warranty, training and incidentals.

Conduit will be paid for under Item 618, "Conduit" and Special Specification 6016, "ITS Multi-Duct Conduit."

Electrical conductors will be paid for under Item 620, "Electrical Conductors."

- 6.3. **Relocate.** 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 "Relocate Fiber Optic Cable." This price is full compensation for relocating all cable, regardless of cable size; for pulling through conduit or duct; aerial installation; terminating; testing; and for materials, equipment, labor, tools, documentation, and incidentals.

- 6.4. **Remove.** 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 "Remove Fiber Optic Cable". This price is full compensation for removing all cable for salvage, regardless of cable size; testing; returning to the Department; and for materials, equipment, labor, tools, documentation, and incidentals.

Special Specification 6054

Spread Spectrum Radios for Traffic Signals



1. DESCRIPTION

Furnish and install spread spectrum radios.

2. MATERIALS

Supply complete manufacturer specifications for radio, antennas, cables, connectors, power supply, mounting hardware, and lightning surge protector, including the exact gain of the antenna.

3. SPREAD SPECTRUM RADIO

Furnish spread spectrum radios with the following operating minimum characteristics:

Table1
Radio Characteristics

Radio Parameters	Radio Requirements
FREQUENCY	902 - 928 MHz
RANGE	15 Miles line of sight
REPEAT CAPABILITIES	Store and Forward Repeater Capabilities
POWER	1.0 Watt Transmitting Power
ENVIRONMENT	Temperature -22°F to 140°F
FCC APPROVAL	No License Requirements Type acceptance under FCC Part 15.247
DATA CHARACTERISTICS	Half or Full Duplex Operation RS232C interface Selectable 1,200 thru 19,200 bps
REGULATED POWER SUPPLY	Voltage 12 DC Amperage 3 Amp Operating Temp -22°F to 140°F

Install radios as shown on the plans or as directed.

Supply radios with diagnostic software capable of testing the link between the master radio and the remote radios. Provide software capable of detecting channels which are not adequate for the transmission of data and allow for the exclusion of these frequencies in the selection of frequencies to be scanned.

4. RADIO ANTENNA

Furnish radio antennas with the following minimum characteristics:

Table2
Antenna Characteristics

Antenna Parameters	Antenna Requirements
REMOTE SITE	Unidirectional (Yagi), Minimum 9 dB gain (dB reference to half wave dipole)
MASTER SITE	Omni-directional, Minimum 6 dB gain (dB reference to half wave dipole)
RANGE	15 Miles
IMPEDANCE	50 Ohm
WIND RATING	125 miles per hour
CONNECTORS	Type "N" Female

Mount the antenna on a traffic signal pole, an illumination pole, or a separate steel pole as directed. Ground the antenna to the metal support. Do not use a wood pole or support.

5. CABLE

Furnish low loss coaxial cable with the following minimum characteristics:

Table3
Coaxial Cable Characteristics

Cable Parameters	Cable Requirements
NOMINAL IMPEDANCE	50 Ohm
MAX ATTENUATION	4.2 dB/100 ft. at 900 MHz

Furnish heliax type cable for runs over 100 ft. in length. Furnish cable connectors with a type "N" male connector. Install cable connectors in accordance with manufacturer's recommendations. Install cable as shown on the plans or as directed.

Furnish a coaxial protector (PolyPhaser IS-50NX-C2, Andrew APG-BNFNF- 090, Huber Suhner 3400-41-0048, or equivalent). Mount coaxial protector adjacent to and bonded to the cabinet ground bus.

6. TESTING, TRAINING, AND WARRANTY

Provide a factory certified representative for installation and testing of the equipment. Conduct a test site survey prior to the installation of the equipment. The Department reserves the right to conduct their own site survey as needed.

When required, provide up to 2 days of training to Department personnel in the operation, setup, and maintenance of the spread spectrum radio system. Provide instruction and materials for a maximum of 20 persons and at a location selected by the Department. Provide instruction personnel certified by the manufacturer. The User's Guide is not an adequate substitute for practical classroom training and formal certification.

Provide equipment with no less than 95% of the manufacturer's standard warranty remaining when equipment invoices are submitted for payment. Any equipment with less than 95% of its warranty remaining will not be accepted.

Provide updates of the spread spectrum radio software free of charge during the warranty period, including the update to NTCIP compliancy.

7. MEASUREMENT

This Item will be measured by each spread spectrum radio, antenna and by the linear foot of cable furnished and installed.

8. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Spread Spectrum Radio," "Antenna" of the type specified, "Coaxial Cable," and "Heliac Cable." The price is full compensation for furnishing, assembling, and installing the spread spectrum radios, antennas, and cable; for mounting attachments; and for testing, labor, tools, equipment, and incidentals.

Special Specification 6058

Battery Back-Up System for Signal Cabinets



1. DESCRIPTION

Install a Battery Back-Up System (BBU System) for traffic signals that will provide reliable emergency power in the event of utility power failure or interruption. The system will also function as a power conditioner and/or voltage regulation device.

A BBU System consists of inverter/charger, manual bypass switch, power transfer switch or automatic bypass switch, batteries, battery monitoring device, wiring, external cabinet or stand-alone cabinet, concrete pad, all necessary hardware and software, and all associated equipment required to operate in a field environment.

The BBU System shall be capable of operating an "LED only" signalized intersection (700W load) for 4 hours of full runtime when utility power is disabled and under ambient temperatures of 25oC. The BBU System shall switch the intersection to flash mode of operation when approximately 40% of battery charge is remaining, via relay contact connection points on the front panel of the unit. The BBU system shall operate the intersection in the flash mode of operation (300W load) for an additional 2 hours. BBU system components shall be rated for a minimum 1400W load capacity.

The BBU shall be designed for outdoor applications in accordance with NEMA TS2-2003, Section 2. All components of the BBU system shall be rated to operate under temperature extremes of -34oC to +74oC.

2. DEFINITIONS

- 2.1. **Automatic Bypass Switch.** A unit connected between the utility power supply and the inverter/charger which can automatically switch power to the controller cabinet service panel from inverter output power to utility line power.
- 2.2. **Battery Back-Up System (BBU System).** The battery back-up system includes, but is not limited to, a manual bypass switch, automatic bypass switch or power transfer switch, inverter/charger, batteries, battery monitoring device, wiring, external cabinet and all necessary hardware for system operation.
- 2.3. **Battery Back-Up System Software.** All software associated with operation, programming and functional requirements of the BBU system.
- 2.4. **Battery Monitoring Device.** The device which monitors battery temperatures and charge rate of the batteries used in the BBU system.
- 2.5. **Batteries.** Standard 12V batteries wired in series to create a 36VDC to 96VDC voltage storage.
- 2.6. **Boost.** When enabled, the BBU inverter/charger shall automatically switch into this mode to raise the utility line voltage when it drops below a preset limit. The limit may be user defined or use manufacturer default settings (typically 100V AC).
- 2.7. **Buck.** When enabled, the unit shall automatically switch into this mode to reduce the utility line voltage when it rises above a preset limit. The limit may be user defined or use manufacturer default settings (typically 135V AC).
- 2.8. **External or Stand-Alone Cabinet.** The structure which houses the system components and/or batteries for the BBU System.

- 2.9. **Inverter/Charger.** The unit which converts the DC voltage input into 120 VAC output for the traffic signal cabinet to operate. As a minimum the inverter/charger shall be rated for 1400 watts.
- 2.10. **Inverter Line Voltage.** The power supplied from the BBU system to the traffic signal cabinet from the BBU System inverter.
- 2.11. **Manual Bypass.** Manual switch that allows user to bypass BBU power to service system equipment. Manual bypass switch switches utility line power directly to cabinet.
- 2.12. **Power Transfer Switch.** A unit connected between the utility power supply and the inverter/charger which can automatically switch from utility line power to inverter output power. The power transfer relay may be a separate unit or combined with the manual bypass switch. In the event of battery voltage loss, the power transfer switch will automatically return to utility line power.
- 2.13. **Signal Operation Mode.** A signalized intersection generating a 700W load when running in normal operation.
- 2.14. **Signal Flash Mode.** A signalized intersection generating a 300W load when running in the flash mode of operation.
- 2.15. **Utility Line Voltage.** The 120V AC power supplied to the BBU system.

3. EQUIPMENT

Ensure electrical materials and construction methods conform to the current NEC and additional local utility requirements. Furnish battery back-up systems prequalified by the Department. The Traffic Operations Division maintains a Material Producer List (MPL) of prequalified battery back-up systems. Ensure all materials and construction methods conform to the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 420, "Concrete Substructures"
- Item 620, "Electrical Conductors"

Provide and install a BBU system that is able to fulfill the following requirements:

- 3.1. **Method of Operation.** The BBU system shall operate using one or more of the following methods:
- 3.1.1. **Buck and Boost Method.** When the buck and boost functions are enabled they shall set the upper and lower control limit allowable for the utility line voltage.
- If the utility line voltage fluctuates above or below the buck and boost values, the BBU system shall raise or lower the voltage by approximately 10-15% of the utility line voltage in an attempt to bring the voltage back into the upper and lower control limits. Buck and boost shall have preset manufacturer defaults.
- If the utility line voltage falls above or below the functional capabilities of buck and boost, then the BBU system will transfer power from the utility line voltage to the inverter line voltage.
- 3.1.2. **Stand-by Method.** The stand-by method shall set upper and lower control limits for the utility line power. If the utility line voltage falls above or below the upper or lower control limits, then the BBU system will transfer power from the utility line voltage to the inverter line voltage.
- 3.1.3. **Continuous Operating Mode, Double Conversion Method.** The continuous method supplies the cabinet with inverter line voltage at all times. This method requires the disabling of buck and boost functions.
- 3.2. **System Capabilities.** The BBU system shall be capable of providing 1400W peak load, with a minimum of 80% inverter efficiency, for at least 10 seconds.

The BBU system shall be capable of providing 700W signal operation load for a minimum of 4 hours, and then switching to and providing 300W signal flash load for an additional 2 hours minimum, when batteries are fully charged.

When the BBU system is running on battery power, the inverter/charger shall be capable of allowing the voltage at which the transition from normal operating load to flash mode occurs (usually 47.5V) to be selected by a user, via relay contacts and connection points on the front panel of the inverter/charger.

The transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, shall be less than 65 milliseconds. The same allowable transfer time shall also apply when switching from inverter line voltage to utility line voltage.

The BBU system shall bypass utility line voltage whenever the utility line voltage is outside of the manufacturer's default, or a user-programmed voltage range, $\pm 2\text{VAC}$.

When the utility line power has been restored to a normal operating voltage for more than a user defined setting (default 30 seconds), the BBU system shall transfer from inverter line voltage to utility line voltage. The BBU system shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.

The BBU system shall be compatible with TS1, TS2 and Model 170/2070 controllers and cabinet components for full run-time operation.

Unless the plans indicate otherwise, provide a BBU in an external battery cabinet. When indicated by the plans, provide a BBU system that can be shelf-mounted in NEMA TS-1 and TS-2 cabinets, or rack-mounted for Model 170/2070 332 cabinets. Provide a manual bypass that is capable of shelf mounting or that can be attached to the side of the signal cabinet. Provide interconnect cables that are no less than 10 ft. in length.

Relay contact wiring for each set of NO/NC relay contact closure terminals shall be no less than 6 feet long and #18 AWG wire. Use manufacturer recommendations for size of wire for any cables lengths greater than 10 feet.

The BBU system shall have lightning surge protection compliant with IEEE/ANSI C.62.41 latest edition and meeting all current UL1449 standards. Lightning surge protection shall be provided to the utility line voltage coming into the inverter/charger. The surge protection device shall be easily accessible and mounted externally from the inverter/charger.

The BBU system, including batteries and hardware, shall be easily replaceable and shall not require any special tools for installation.

The BBU system shall operate in automatic "fail-safe" mode. Should a breaker trip on the inverter/charger and/or the power transfer switch, the system will automatically operate from utility line power and bypass the BBU system.

As stated above, in addition to the inverter/charger, the BBU shall be provided with both an external manual bypass switch and either an external automatic transfer switch or external automatic bypass switch.

The BBU system shall be capable of logging up to 100 events. Events shall date- and time-stamp faults with utility line voltage and battery voltages. At the minimum, the BBU system shall log an event when:

- the utility line voltage falls above or below the upper or lower control limits,
- the BBU system automatically switches to battery power, and
- when self-monitoring BBU system components fail.

3.3. **Displays, Controls, Diagnostics and Maintenance.** The BBU system shall include a front panel display. All applicable programmable functions of the operational methods described in this specification shall be viewable from the front panel display.

All events described in Section 3.2, "System Capabilities" shall be viewable from the front panel display.

The BBU system software shall be programmable from the front panel of the inverter/charger by means of a keyboard or momentary buttons allowing user to step through menu driven software.

A 10/100 Ethernet port shall be provided on the front panel of the inverter/charger.

A RS232 port shall be provided on the front panel of the inverter/charger.

The BBU system software shall be provided for the operational needs of the BBU system. The user/operator shall be able to access all system software via the Ethernet and RS232 ports on the front panel of the inverter/charger. The user shall be able to read logged events and change programmable parameters from the keyboard, laptop or local area network via the Ethernet port.

System software shall be upgradeable via the RS232 port on the front panel of the inverter/charger.

- 3.4. **Inverter/Charger.** The inverter/charger is the unit that provides the voltage regulation; power conditioning of utility line power; convert the DC voltage input into 120 VAC output for the traffic signal cabinet to operate; provides emergency backup power upon loss of utility power and provides for temperature compensated battery charging. As a minimum the inverter/charger shall be rated for 1400 watts. Provide a minimum of 6 sets of normally open (NO) and normally closed (NC) single-pole double-throw dry contact relay closures on the front face of the inverter/charger and labeled so as to identify each contact. The relay closures shall consist a set of NO/NC contact closures that shall be energized whenever the unit switches to battery power (contact shall be labeled or marked as "On Battery" or equivalent) and a second set of NO/NC contact closures shall be energized whenever the battery approaches 40% remaining capacity (contact shall be labeled or marked as "Low battery" or equivalent), which will determine when the unit will switch from normal operation to flash. A third set of NO/NC contact closures shall be energized after a user settable time after the unit switches to battery power. The contact may be labeled "Timer. The remaining relays shall be user definable.

Operating temperature range for both the inverter/charger and power transfer relay shall be -34°C to +74°C. When battery power is used, the BBU system output voltage shall be between 110VAC and 125VAC, pure sine wave output, $\leq 3\%$ THD, 60Hz ± 3 Hz.

- 3.5. **Manual Bypass Switch.** The manual bypass switch shall be provided as a separate unit external to the inverter/charger unit. The manual bypass switch shall consist of housing, two position switch, terminal blocks, internal wiring, service outlet, circuit breakers and mounting hardware. All components shall be rated at a minimum of 240VAC / 30 amp. Provide the manual bypass switch with # 8 terminal blocks. The manual bypass switch shall be 2 position and allow the user to switch utility line power directly to the cabinet service panel. The switch positions will provide the following functions. In the "Bypass" position the inverter is bypassed, utility power is removed from the BBU and passed directly to the signal power panel. In the "UPS" position the inverter / switch is powered and the signal circuits are supplied by the output of the inverter. When the manual bypass switch is in the "Bypass" position the user may replace the automatic bypass switch (or transfer switch) and the inverter/charger without interrupting power to the intersection. Provide the manual bypass switch with over current protection (20 Amp circuit breaker).

- 3.6. **Power Transfer Switch.** These requirements are for BBU systems provided with a power transfer switch. The power transfer switch will operate such that the inverter/charger input and cabinet power panel are supplied with power from the utility line, in the event that the utility line power is lost or requires conditioning (buck or boost) the power transfer switch will automatically connect the inverter/charger output to the cabinet power panel such that the inverter/charger output provides the power. In the event of inverter/charger failure, battery failure, or complete battery discharge, the power transfer shall revert to the NC (de-energized) state, where utility line power is connected to the cabinet service panel.

All wire to the power transfer switch from the manual bypass switch, to and from the inverter/ charger and from the manual bypass switch to utility power service shall be sized accordingly with system requirements.

- 3.7. **Automatic Bypass Switch.** These requirements are for BBU systems provided with an automatic bypass switch. The automatic bypass switch will operate such that the inverter/charger input is supplied with power

from the utility line and the cabinet power panel is supplied with power from the output of the inverter/charger. In the event of inverter/charger failure, battery failure, or complete battery discharge, or other loss of power from the output of the inverter/charger, the automatic bypass switch shall revert to the NC (de-energized) state, where utility line power is connected to the cabinet service panel.

3.8. **Batteries.** Provide batteries from the same manufacturer/vendor of the BBU system.

Individual batteries shall be 12V type, and shall be easily replaceable and commonly available for purchase by common off-the-shelf equivalent.

Batteries shall be sized and rated to operate a 700W load for 4 hours (normal operation) followed by a 300W load for 2 hours (flash operation) for a total of 6 hours.

Battery configuration shall consist of 12V batteries arranged for total voltages of 36V, 48V, 60V, 72V, 84V or 96V.

Batteries shall be deep-discharge, sealed prismatic lead-calcium based, valve-regulated maintenance-free batteries.

Batteries shall operate over a temperature range of -34°C to +74°C.

Batteries shall indicate maximum recharge data and recharging cycles, and manufacturer defaults on the inverter/charger shall not allow the recharging process to exceed the batteries maximum values.

Battery interconnect wiring shall connect to the inverter unit via modular harness with red and black cabling that terminates into a typical power pole style connector. Harness shall be equipped with mating power flag style connectors for batteries and a single insulated plug-in style connection to inverter/charger unit. Harness shall allow batteries to be quickly and easily connected in any order and shall be keyed to ensure proper polarity and circuit configuration. A fusible link or device sized accordingly with system requirements and to protect against currents exceeding each battery current rating shall be provided within 3 inches of the negative and positive leads of each battery. Fusible links shall be insulated stranded wire.

Insulated covers shall be provided at the connection points (post) as to prevent accidental shorting.

Battery cables provided to connect battery to battery harness main cable shall be a minimum of 18 in. or long enough to accommodate the battery covers provided with the battery ground box, whichever is longer. Battery harness shall be sized accordingly with system requirements.

3.9. **Battery Monitoring System.** The BBU system shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 – 4.0 mV/°C per cell.

The temperature sensor shall be used to monitor the temperature and regulate the charge rate of the batteries. Unless required otherwise by the plans the temperature sensor wire shall be as follows:

- 8 feet long if external side-mounted cabinet is attached to existing controller cabinet.
- 8 feet long if batteries are housed in traffic signal base used for cabinet foundation and batteries are stored on shelf within base.
- 8 feet long if stand-alone cabinet is used.

Should the temperature sensor fail, the inverter/charger shall not allow the BBU system to overcharge the batteries. The BBU system shall provide an alarm should the temperature sensor fail.

Recharge time for the batteries to obtain 80% or more of full battery charge capacity shall not exceed 20 hours at 21°C (70°F).

Batteries shall not be charged when battery temperature exceeds 50°C.

The BBU system shall monitor battery strings within a system and set a fault indicator if battery voltage falls below normal operating voltage.

- 3.10. **Battery Housing.** Unless plans require otherwise, project an external battery cabinet or stand-alone BBU/battery cabinet as specified below.

- 3.10.1. **External Battery Cabinet.** The external cabinet shall be NEMA type 3R all-aluminum with stainless-steel hardware, or approved equivalent. The external cabinet shall be designed to attach on the side of a TS2 size 6 base-mount cabinet. The batteries, inverter, transfer switches, manual bypass and all associated hardware shall be housed in the external cabinet.

The external cabinet shall be equipped with proper ventilation, electric fan, and air filter in accordance with TS2 standards.

External cabinets will be equipped with a door opening to the entire cabinet. The door shall be attached to the cabinet with a full length stainless steel piano hinge or four, two-bolts per leaf, hinges. The door shall be provided with the same latch and lock mechanism as required for standard traffic signal cabinet. In addition, a padlock clasp will be provided.

When using battery ground boxes, an external cabinet is required for the non-battery components. .

- 3.10.2. **Stand-Alone BBU/Battery Cabinet.** When required for installation by the plans a stand-alone cabinet in accordance with the following shall be provided.

The stand-alone cabinet shall conform to all the specifications of the External BBU/Battery Cabinet, except that it will not mount to the controller cabinet. The stand-alone cabinet shall be designed to attach to a concrete pad.

- 3.11. **Concrete Pad.** Provide a Class B concrete pad as a foundation for stand-alone cabinets of the size shown in the plans. For external cabinets, extend the controller foundation to provide a class B concrete pad under the external cabinet of the size shown in the plans.

- 3.12. **Documentation.** Operation and maintenance manuals shall be provided. The operation manual shall include a block diagram schematic of all system hardware components. The manual shall include instructions for programming and viewing software features. The manual shall include all uploading/downloading (communications protocol) requirements via RS232 or Ethernet port.

Board level schematics shall be provided when requested.

Battery documentation and replacement information shall be provided.

- 3.13. **Testing.** The Department reserves the right to do testing on BBU systems to ensure Quality Assurance on unit before installation and random sampling of units being provided to the State. BBU systems that fail will be taken off the Qualified Products List (QPL).

Department QPL testing procedures will check compliance with all the criteria of this specification including the following:

- Event logging for fault/alarm conditions
- Demonstrated use of one or more of the operating methods described in Section 3.1., "Method of Operation."
- Testing of ability to power a 700W load for 4 hours, transfer to flash mode and power a 300W load for 2 additional hours, at an ambient temperature of +25°C.
- Testing of all components in environmental chamber (temperature ranges from -30°C to +74°C) following NEMA TS2 2003 standards, Section 2.

- 3.14. **Warranty, Maintenance and Support.** Provide a BBU containing a warranty that requires the manufacturer to replace failed BBUs when non-operable due to defect in material or workmanship within five years of date of purchase from manufacturer. Supply a BBU with no less than 95% of the manufacturer's warranty remaining on the date that the BBU is installed and begins operating. The replacement BBU must meet requirements of this specification. The Contractor will handle all warranty issues until the date of final acceptance.

Batteries shall be warranted for full replacement for 5 years. Batteries shall be defined as bad if they are not able to deliver 80% of battery rating.

4. MEASUREMENT

This Item will be measured by each BBU system installed.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "BBU System" of the type (type of BBU cabinet) specified. This price is full compensation for furnishing, installing, and testing the completed installation, BBU system and associated equipment, mounting hardware, class B concrete pad, software, conduit, conductors; and equipment, labor, tools; and incidentals.

Special Specification 6083

Video Imaging and Radar Vehicle Detection System



1. DESCRIPTION

This specification sets forth the minimum requirements for a system that detects vehicles on a roadway using a multi-sensor detection system.

The multi-sensor system must utilize two different sensors of different technologies, video imaging and radar, to detect and track licensed and unlicensed vehicles at distances up to 600 ft. The sensor system must fuse vehicle information from the two sensors to provide highly accurate and precise detection for special or advanced applications.

The multi-sensor system must use a primary detector rack mounted processor to interface with the traffic control cabinet. The module must process information from both video imaging and radar sensors simultaneously in real-time.

1.1. **System Configurations.** The multi-sensor detection system (MSDS) must consist of up to two video cameras and radar units, detection processors (DP) capable of processing from one to two intersection approaches, output extension modules, surge suppressors, a setup tool and a pointing device.

1.2. **Available System Configurations.** The MSDS will be deployed at locations where site conditions and roadway geometry vary. The MSDS system may also be deployed at locations where existing cabinets or equipment exist. Existing site configurations will dictate the availability of cabinet space and MSDS usage.

The proposed MSDS must be available in various configurations to allow maximum deployment flexibility. Each configuration must have an identical user interface for system setup and configuration. The communications protocol to each configuration must be identical and must be hardware platform independent. The proposed MSDS must have multiple configurations available for deployment in accordance with Table 1.

Table 1
MSDS Configuration

Description	No. of Multi-Sensor Inputs	No. Video Outputs	Mounting Configuration	Power Supply Requirements
Single-Channel Rack Mounted	1	1	Rack Mount (Type 170 or NEMA TS-1, TS-2 Racks)	12 or 24 VDC Power from Rack
Dual-Channel Rack Mounted	2	1	Rack Mount (Type 170 or NEMA TS-1, TS-2 Racks)	12 or 24 VDC Power from Rack

1.3. **System Software.** The system must include software that detects vehicles in multiple lanes. Video imaging detection zones must be defined using only an on-board video menu and a pointing device to place the zones on a video image. Up to 24 video detection zones per camera view must be available. Two additional trigger zones for the radar sensor must be available and be configurable by using the same system setup menu on the DP. A separate computer must not be required to program the detection zones. A portable setup tool must be available for sensor alignment and adjustment of camera's field of view and focus menu on the DP. A separate computer must not be required to program the detection zones. A portable setup tool must be available for sensor alignment and adjustment of camera's field of view and focus.

2. MATERIALS

2.1. **Multi-Sensor Detection System Hardware.**

The MSDS hardware must consist of the following four elements:

- Video imaging camera sensor
- Radar sensor
- Sensor data combiner
- Detection processor

The MSDS must be made in the U.S.A. in compliance with FTA "Buy America" regulations.

2.2.

Video Imaging Camera Sensor. To accommodate deployment flexibility, the MSDS camera sensor must be compatible with all DP platforms identified in Table 1. The MSDS camera sensor must be supplied by the MSDS manufacturer.

The advanced camera enclosure must utilize Indium Tin Oxide (ITO) technology for the heating element of the front glass. The transparent coating must not impact the visual acuity and must be optically clear.

Cable terminations at the data combiner for video and power must not require crimping or special tools.

The camera sensor must allow the user to set the focus and field of view via Wi-Fi connectivity.

The camera must produce a useable video image of the bodies of vehicles under all roadway lighting conditions, regardless of time of day. The minimum range of scene luminance over which the camera must produce a useable video image must be the minimum range from nighttime to daytime, but not less than the range of 1.0 to 10,000 lux.

The camera electronics must include automatic gain control (AGC) to produce a satisfactory image at night.

The imager luminance signal to noise ratio (S/N) must be more than 50 dB with the automatic gain control (AGC) disabled.

The imager must employ 3-dimensional dynamic noise reduction (3D-DNR) to remove unwanted image noise.

The camera imager must employ wide dynamic range (WDR) technology to compensate for wide dynamic outdoor lighting conditions. The dynamic range must be greater than 100 dB.

The camera must be digital signal processor (DSP) based and must use a CCD sensing element and must output color video with resolution of not less than 550 TV lines.

The camera sensor must include an electronic shutter control based upon average scene luminance and must be equipped with an auto-iris lens that operates in tandem with the electronic shutter. The electronic shutter must operate within the range of 1/1 to 1/10,000th sec.

The camera sensor must utilize automatic white balance.

The camera sensor must include a variable focal length lens with variable focus that can be adjusted, without opening up the camera housing, to suit the site geometry by means of a portable interface device designed for that purpose and manufactured by the detection system supplier.

The horizontal field of view must be adjustable from 4.6° to 53.6°. This camera configuration may be used for the majority of detection approaches in order to minimize the setup time and spares required by the user. The lens must be a 12x zoom lens with a focal length of 3.7 to 44.0 mm.

The lens must also have an auto-focus feature with a manual override to facilitate ease of setup.

The camera must incorporate the use of preset positioning that store zoom and focus positioning information. The camera must have the capability to recall the previously stored preset upon application of power.

The camera must be housed in a weather-tight sealed enclosure conforming to IP-67 specifications. The housing must allow the camera to be rotated to allow proper alignment between the camera and the traveled road surface.

The camera enclosure must be equipped with a sunshield. The sunshield must include a provision for water diversion to prevent water from flowing in the camera's field of view.

The camera enclosure must be design so that the pan, tilt and rotation of the camera assembly can be accomplished independently without affecting the other settings.

The camera enclosure must include a proportionally controlled Indium Tin Oxide heater design that maximizes heat transfer to the lens. The output power of the heater must vary with temperature, to assure proper operation of the lens functions at low temperatures and prevent moisture condensation on the optical faceplate of the enclosure.

The glass face on the front of the enclosure must have an anti-reflective coating to minimize light and image reflections.

When mounted outdoors in the enclosure, the camera must operate in a temperature range from -34°C to +74°C and a humidity range from 0 to 100% RH. Measurement of satisfactory video must be based upon DP system operation.

The camera sensor must acquire its power from the sensor data combiner.

Recommended camera placement height must be between 18 and 33 ft. (or 6 and 10 m) above the roadway, and over the traveled way on which vehicles are to be detected. For optimum detection the camera must be centered above the traveled roadway. The camera must view approaching vehicles at a distance not to exceed 350 ft. for reliable detection (height to distance ratio of 10:100). Camera placement and field of view (FOV) must be unobstructed and as noted in the installation documentation provided by the supplier.

The video signal must be fully isolated from the camera enclosure and power cabling

A weather-proof protective cover must be provided to protect all terminations at the camera.

2.3.

Radar Sensor. The radar sensor must operate in the 24 GHz frequency band and must operate on one of seven available enumerated channels that is user selectable.

The radar detection range must be 600 ft. minimum, +/- 5%.

The radar sensor must be able to track up to 20 independent objects simultaneously.

Object speed detection must be within the range of 0 and 150 mph +/- 1.0 mph.

The radar sensor must be able to detect vehicles in one to four traffic lanes.

The radar sensor must be housed in a weather-tight sealed enclosure conforming to IP-67 specifications. The housing must allow the radar to be adjusted to allow proper alignment between the sensor and the traveled road surface.

When mounted outdoors in the enclosure, the radar must operate in a temperature range of -34°C to +74°C and a humidity range from 0 to 100% RH.

The radar sensor must communicate with the sensor data combiner.

The radar sensor must acquire its power from the sensor data combiner.

- 2.4. **Multi-Sensor Assembly.** Both camera and radar sensors must be housed in an overall, single enclosure assembly.
- The overall size of the multi-sensor enclosure must not exceed 14 in. x 15 in. x 17 in.
- The overall weight of the multi-sensor unit must not exceed 11 lb.
- The effective projected area (EPA) must not exceed 2.0 sq. ft.
- The maximum power consumption for the multi-sensor assembly must be less than 10W typical, 20W peak.
- 2.5. **Sensor Data Combiner.** A sensor data combiner that combines sensor information from both video and radar sensors must be employed.
- The sensor data combiner must supply primary power to each sensor unit.
- The sensor data combiner must facilitate digital communications between the sensor data combiner and each of the sensor units.
- The sensor data combiner must get its primary power from an AC power source using industry standard 3-conductor cabling.
- The sensor data combiner must communicate with the detection processor using a single coax cable. Both video imaging and radar data must use the single coax cable.
- The sensor data combiner must also employ industry standard Wi-Fi connectivity for remote sensor system setup using a mobile programming device such as a netbook or tablet computer. Video camera and radar sensor must be able to be configured independently.
- The sensor data signal must be fully isolated from the mechanical enclosure and power cabling.
- Cable terminations at the sensor data combiner must not require crimping tools.
- The sensor data combiner must be housed in a weather-tight sealed enclosure conforming to IP-67 specifications.
- 2.6. **Detection Processor (DP).** Each sensor input must accept RS170 (NTSC) or CCIR (PAL) signals from an external video source. The interface connector must be BNC type and must be located on the front of the processing unit. The sensor input must have the capability to be terminated into 75 ohms or high impedance (Hi-Z) using dip switches or software control from the user menu. The sensor input must also facilitate the data from the radar sensor.
- A LED indicator must be provided to indicate the presence of the sensor signal. The LED must illuminate upon valid sensor synchronization and turn off when the presence of a valid sensor signal is removed.
- One video output must be provided. The video output must be RS170 or CCIR compliant and must pass through the input video signal.
- For multi-channel video input configurations, a momentary push-button must be provided on the front panel to cycle through each input video channel. In the absence of a valid sensor signal, the channel must be skipped and the next valid sensor signal must be switched. The real-time video output must have the capability to show text and graphical overlays to aid in system setup. The overlays must display real-time actuation of detection zones upon vehicle detection or presence. Overlays must be able to be turned off by the user. Control of the overlays and sensor switching must also be provided through the serial communications port. The video output interface connector must be positive locking BNC type. Friction type (e.g. RCA type) connectors must not be allowed.

A serial communications port must be provided on the front panel. The serial port must be compliant with EIA232 electrical interfaces and must use a DB9 type connector mounted on the front panel of the DP. The serial communications interface must allow the user to remotely configure the system and to extract calculated vehicle and roadway information. The interface protocol must be documented or interface software must be provided. The interface protocol must support multi-drop or point-to-multipoint communications. Each MSDS must have the capability to be addressable. The DP must support data rates of 1,200 to 230,400 bps, inclusive.

Open collector (contact closure) outputs must be provided. Four open collector outputs must be provided for the single or dual channel rack-mount configuration. Additionally, the DP must allow the use of extension modules to provide up to 24 open collector contact closures per camera input. Each open collector output must be capable of sinking 30 mA at 24 VDC. Open collector outputs will be used for vehicle detection indicators as well as discrete outputs for alarm conditions. The DP outputs must be compatible with industry standard detector racks assignments.

Logic inputs such as delay/extend or delay inhibit must be supported through the appropriate detector rack connector pin or front panel connector in the case of the I/O module. For DPs and extension modules, four inputs must be supported via detector rack interface. The I/O module must accommodate eight inputs through a 15-pin "D" connector.

Detection status LEDs must be provided on the front panel. The LEDs must illuminate when a contact closure output occurs. Rack-mounted detection processors must have a minimum of four LEDs. Rack-mounted extension modules must have two, four or eight LEDs (depending upon extension module type) to indicate detection.

The front panel of the DP must have detector test switches to allow the user to manually place calls on each DP output channel. The test switch must be able to place either a constant call or a momentary call depending on the position of the switch.

A USB mouse port must be provided on the front panel of the rack mount detection processing unit. The mouse port must not require special mouse software drivers. The mouse port must be used as part of system setup and configuration. A mouse must be provided with each detection processor.

Extension modules must be connected to the DP by an 8-wire twisted-pair cable with modular RJ45 connectors. DP and EM communications must be accommodated by methods using differential signals to reject electrically coupled noise.

Extension modules (EM) must be available to eliminate the need of rewiring the detector rack, by enabling the user to plug an extension module into the appropriate slot in the detector rack to provide additional open collector outputs. The extension module must be available in both two and four channel configurations. EM configurations must be programmable from the DP. A separate I/O module with 32 outputs through a 37-pin "D" connector on the front panel and eight inputs through a 15-pin "D" connector using an external wire harness for expanded flexibility must also be available.

The DP and EM must be specifically designed to mount in a standard detector rack, using the edge connector to obtain power, provide contact closure outputs and accept logic inputs (e.g. delay, extend). No adapters must be required to mount the DP or EM in a standard detector rack. Detector rack rewiring must not be required.

The DP must utilize non-volatile memory technology to store on-board firmware and operational data.

The DP must enable the loading of modified or enhanced software through the EIA232 or USB port (using a USB thumb drive) and without modifying the DP hardware.

The DP and EM must be powered by 12 or 24 VDC. DP and EM modules must automatically compensate for either 12 or 24 VDC operation. DP power consumption must not exceed 7.5W. The EM power consumption must not exceed 3W.

The DP must operate satisfactorily in a temperature range from -34°C to +74°C and a humidity range from 0 to 95% RH, non-condensing as set forth in NEMA specifications.

An Edco CX-06M video surge suppresser must be provided for each sensor input. The surge suppresser must be appropriately grounded to the cabinet ground rod using 14 AWG minimum.

- 2.7. **System Software.** Detection zones must be programmed via an on-board menu displayed on a video monitor and a pointing device connected to the DP. The menu must facilitate placement of detection zones and setting of zone parameters or to view system parameters. A separate computer must not be required for programming detection zones or to view system operation.

The DP must store up to three different detection zone patterns in non-volatile memory. The DP can switch to any one of the three different detection patterns within 1 sec. of user request via menu selection with the pointing device. Each configuration must be uniquely labeled and able to be edited by the user for identification. The currently active configuration indicator must be displayed on the monitor.

The DP must detect vehicles in real time as they travel across each detection zone.

The DP must accept new detection patterns from an external computer through the EIA232 port when the external computer uses the correct communications protocol for downloading detection patterns. A Windows™-based software designed for local or remote connection and providing video capture, real-time detection indication and detection zone modification capability must be provided with the system.

The DP system must have the capability to automatically switch to any one of the stored configurations based on the time of day which must be programmable by the user.

The DP must send its detection patterns to an external computer through the EIA232 port when requested when the external computer uses the appropriate communications protocol for uploading detection patterns.

The DP must default to a safe condition, such as a constant call on each active detection channel, in the event of unacceptable interference or loss of the sensor signal.

The system must be capable of automatically detecting a low-visibility condition such as fog and respond by placing all effected detection zones in a constant call mode. A user-selected alarm output must be active during the low-visibility condition that can be used to modify the controller operation if connected to the appropriate controller input modifiers. The system must automatically revert to normal detection mode when the low-visibility condition no longer exists.

Up to 24 detection zones per camera input must be supported and each detection zone can be sized to suit the site and the desired vehicle detection region.

The DP must support two independent trigger points for radar outputs for dilemma zone applications.

The DP must provide up to 24 open collector output channels per sensor input using one or more extension modules.

A single detection zone must be able to replace multiple inductive loops and the detection zones must be OR'ed as the default or may be AND'ed together to indicate vehicle presence on a single approach of traffic movement.

Placement of detection zones must be done by using only a pointing device, and a graphical interface built into the DP and displayed on a video monitor, to draw the detection zones on the video image from each video camera. No separate computer must be required to program the detection zones.

When a vehicle is detected within a detection zone, a visual indication of the detection must activate on the video overlay display to confirm the detection of the vehicle for the zone.

Detection must be at least 98% accurate in good weather conditions, with slight degradation possible under adverse weather conditions (e.g. rain, snow, or fog) which reduce visibility.

Detection accuracy is dependent upon site geometry, camera placement, camera quality and detection zone location, and these accuracy levels do not include allowances for occlusion or poor video due to camera location or quality.

The DP must provide dynamic zone reconfiguration (DZR). DZR enables normal operation of existing detection zones when one zone is being added or modified during the setup process. The new zone configuration must not go into effect until the configuration is saved by the operator.

Detection zone setup must not require site specific information such as latitude and longitude to be entered into the system.

The DP must process the video input from each camera at 30 frames per second. Multiple camera processors must process all video inputs simultaneously.

The DP must output a constant call during the background learning period of no more than 3 min.

Detection zone outputs must be configurable to allow the selection of presence, pulse, extend, and delay outputs. Timing parameters of pulse, extend, and delay outputs must be user definable between 0.1 to 25 sec.

Up to 6 video detection zones per sensor input must have the capability to count the number of vehicles detected. The count value must be internally stored for later retrieval through the EIA232 port. The zone must also have the capability to calculate and store average speed and lane occupancy at bin intervals of 10 sec., 20 sec., 1 min., 5 min., 15 min., 30 min. and 60 min. One radar sensor zone must also count vehicles, calculate, and store the average speed and lane occupancy across the approach.

In addition to the count type zone, the DP must be able to calculate and acquire average speed and lane occupancy using both video and radar sensors. These values must be stored in non-volatile memory for later retrieval.

The DP must have an "advance" zone type where detection outputs to the traffic controller is compensated for angular occlusion and distance.

The DP must employ color overlays on the video output.

The DP must have the ability to show phase status (green, yellow, or red) for up to eight phases. These indications must also be color coded.

The user must have the ability to enable or disable the display of the phase information on the video output.

The DP must have the capability to change the characteristics of a detection zone based on external inputs such as signal phase. Each detection zone must be able to switch from one zone type (i.e. presence, extension, pulse, etc.) to another zone type based on the signal state. For example, a zone may be a "count" zone when the phase is green but change to a "presence" zone type when the phase is not green.

Another application would be zone type of "extension" when the signal phase is green and then "delay" when red.

For alpha numeric user inputs, the DP must utilize a virtual keyboard on the video overlay system to ease user input. The virtual keyboard must use the standard QWERTY keyboard layout.

The DP must aid the user in drawing additional detection zones by automatically drawing and placing zones at appropriate locations with only a single click of the mouse. The additional zone must utilize geometric

extrapolation of the parent zone when creating the child zone. The process must also automatically accommodate lane marking angles and zone overlaps.

When the user wishes to modify the location of a zone, the DP must allow the user to move a single zone, multiple zones or all zones simultaneously.

When the user wishes to modify the geometric shape of the zone, the DP must allow the user to change the shape by moving the zone corner or zone sides.

On screen zone identifiers must be modifiable by the user. The user must be allowed to select channel output assignments, zone type, input status, zone labels or zone numbers to be the identifier.

For multiple camera input DPs, the user must have the ability to enable automatic video output switching. The dwell time for each sensor input must be user programmable.

For radar sensor zones, the output can be triggered by presence of a vehicle only or by presence of a vehicle above a user-defined speed threshold.

3. CONSTRUCTION

The coaxial cable to be used between the multi-sensor assembly and the DP in the traffic cabinet must be Belden 8281. This cable must be suitable for installation in conduit or overhead with appropriate span wire. BNC plug connectors must be used where applicable. The coaxial cable, BNC connector, and crimping tool must be approved by the supplier of the MSDS, and the manufacturer's instructions must be followed to ensure proper connection.

The power cabling must be 16 AWG three-conductor cable with a minimum outside diameter of 0.325 in. and a maximum diameter of 0.490 in. The cabling must comply with the National Electric Code, as well as local electrical codes. Cameras may acquire power from the luminaire if necessary.

The MSDS must be installed by factory-certified installers as recommended by the supplier and documented in installation materials provided by the supplier. Proof of factory certification must be provided.

3.1. Testing.

The installed assembly will be field tested prior to being placed into service to ensure all components are functioning as described herein.

The supplier must provide a limited 5 yr. warranty on the MSDS. During the warranty period, technical support must be available from the supplier via telephone within 4 hr. of the time a call is made by a user, and this support must be available from factory-certified personnel or factory-certified installers. During the warranty period, updates to DP software must be available from the supplier without charge.

The supplier must maintain an adequate inventory of parts to support maintenance and repair of the MSDS. These parts must be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale for said parts.

The supplier must maintain an ongoing program of technical support for the MSDS. This technical support must be available via telephone, or via personnel sent to the installation site upon placement of an acceptable order at the supplier's then current pricing and terms of sale for onsite technical support services.

Installation or training support must be provided by a factory-authorized representative and must be a minimum IMSA-Level II Traffic Signal Technician certified.

4. MEASUREMENT

This Item will be measured by each unit shown in the plans furnished, installed, made fully operational, and tested in accordance with this special specification or as directed.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Video Imaging and Radar Vehicle Detection System." This price will be full compensation for furnishing, installing, internal electrical conductors, connectors and mounting hardware; and for all labor, tools, equipment, testing documentation and incidentals necessary to complete the work.

Special Specification 6292

Radar Vehicle Detection System for Signalized Intersection Control



1. DESCRIPTION

Furnish, install, relocate, or remove radar vehicle detection systems (RVDS) of the specified devices at signalized intersections to provide the required zones of detection as shown on the plans, or as directed.

2. MATERIALS

- 2.1. **General.** Except as allowed for relocation of RVDS equipment, ensure all equipment and component parts are new in accordance with Section 1.0 through Section 6.0 of Division Specification [TO-8000](#), "Radar Vehicle Detection System." and in an operable condition at time of delivery and installation.

The Traffic Management Section of the Traffic Operations Division (TRF-TM) maintains the Prequalified Products Master List (QPL) of all RVDS conforming to the requirements of this Specification. New materials appearing on the [QPL for TO-8000](#) require no further sampling and testing before use unless deemed necessary by the Project Engineer or TRF-TM. Provide prequalified RVDSs from the Division's QPL.

Ensure all RVDS serving the same detection purpose within the project are from the same manufacturer. RVDS devices are classified by their functional requirements. The functional requirements are for radar presence detection devices (RPDD) and radar advance detection devices (RADD). The RVDS system classifications are RVDS (RPDD Only), RVDS (RADD Only)" and "RVDS (RPDD and RADD).

Provide each RVDS sensor with a mounting bracket designed to mount directly to a pole, mast-arm, or other structure. Ensure bracket is designed such that the sensor can be tilted both vertically and horizontally for alignment and then locked into place after proper alignment is achieved. All hardware must be designed to support the load of the RVDS sensor and mounting bracket.

- 2.2. **Configuration.** Ensure the RVDS will provide vehicle detection as required on the plans, or as directed.

Ensure the RVDS does not require tuning or recalibration to maintain performance once initial calibration and configuration is complete. RVDS must not require cleaning or adjustment to maintain performance.

RVDS must self-recover from power failure once power is restored.

- 2.3. **Cabling.** Provide appropriate length of all cables necessary to complete the work (of making the RVDS fully operational) at each installation site.

- 2.4. **Software.** Ensure the RVDS manufacturer includes all software required to configure and monitor operation of RVDS field equipment locally and remotely. RVDS software must be a stable production release.

Software must allow the user to configure, operate, exercise, diagnose, and read current status of all RVDS features and functions using a laptop computer.

Software must include the ability to save a local copy of RVDS field device configurations, and load saved configurations to RVDS field devices.

Ensure all licenses required for operation and use of software are included at no additional cost.

Software updates must be provided at no additional cost during the warranty period.

- 2.5. **Electrical.** All conductors supplying the equipment must meet National Electrical Code® (NEC) requirements.

Ensure equipment is designed to protect personnel from exposure to high voltage during installation, operation, and maintenance.

- 2.6. **Mechanical.** Ensure that all parts are fabricated from corrosion resistant materials, such as plastic, stainless steel, aluminum, or brass.

Ensure that all screws, nuts, and locking washers are corrosion resistant. Do not use self-tapping screws.

Ensure equipment is clearly and permanently marked with manufacturer name or trademark, part number, date of manufacture, and serial number.

Ensure RVDS is modular in design for ease of field replacement and maintenance. Provide a sensor that will minimize weight and wind loading when mounted on a traffic signal pole or mast arm.

All printed circuit boards (PCB) must have conformal coating.

- 2.7. **Environmental.** RVDS sensor must be able to withstand the maximum wind load based on the Department's basic wind velocity zone map standard without any damage or loosening from structure.

The RVDS enclosure must conform to criteria set forth in the NEMA 250 Standard for Type 4X enclosures.

The RVDS must meet all NEMA TS2 environmental requirements for temperature, humidity, transients, vibration, and shock.

- 2.8. **Connectors and Harnesses.** Ensure all conductors are properly color coded and identified.

Ensure cable connector design prohibits improper connections. Cable connector pins are plated to improve conductivity and resist corrosion.

Connections for both data and power must be made to the RVDS sensor using waterproof, quick disconnect connectors. Pigtails from the sensor to a waterproof junction box (NEMA 4) or an approved waterproof connector must be allowed for splicing. The pigtails must not be shorter than 3 ft. unless otherwise shown on the plans.

3. CONSTRUCTION

- 3.1. **System Installation.** Install RVDS system devices according to the manufacturer's recommendations to provide properly functioning detection as required. This will include the installation of sensors on signal poles or mast-arms, controller interface modules, power and surge protection panels, cabling and all associated equipment, software, serial and Ethernet communication ports, connectors and hardware required to setup and operate. Ensure that the supplier of the RVDS provides competent on-site support representative during installation to supervise installation and testing of the RVDS. Ensure the radar sensor locations are optimal for system operation and operate as required. Maintain safe construction practices during equipment installation.

Ensure installation and configuration of software on Department computers is included with the RVDS.

Use care to prevent damage to any support structures. Any equipment or structure damaged or lost must be replaced by the Contractor (with items approved by the Engineer) at no cost to the Department.

3.2. **Mechanical Components.** Ensure that all fasteners, including bolts, nuts, and washers with a diameter less than 5/8 in. are Type 316 or 304 stainless steel and meet the requirements of ASTM F593 and ASTM F594 for corrosion resistance. Ensure that all bolts and nuts 5/8 in. and over in diameter are galvanized and meet the requirements of ASTM A307. Separate dissimilar metals with an inert dielectric material.

3.3. **Wiring.** Install all wiring and electrical work supplying power to the equipment in a neat workmanlike manner. Supply and install all wiring necessary to interconnect RVDS sensors to the traffic signal cabinet and incidentals necessary to complete the work. Furnish and install any additional required wiring at no additional cost to the Department.

Wiring must be cut to proper length prior to installation. Provide cable slack for ease of removal and replacement. All cable slack must be neatly laced with lacing or straps in the bottom of the cabinet. Ensure cables are secured with clamps.

3.4. **Grounding.** Ensure all RVDS components, cabinets, and supports are grounded in accordance with the NEC and manufacturer recommendations.

3.5. **Relocation of RVDS Field Equipment.** Perform the relocation in strict conformance with the requirements herein and as shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during relocation.

Inspect the existing RVDS field equipment with a representative from the Department and document any evidence of damage prior to removal. Conduct a pre-removal test in accordance with the testing requirements contained in this Item to document operational functionality. Remove and deliver equipment that fails inspection to the Department.

Prior to removal of existing RVDS field equipment, disconnect and isolate the power cables from the electric power supply and disconnect all communication cabling from the equipment located inside the cabinet. Coil and store power and communication cabling inside the cabinet until relocation. Remove existing RVDS field equipment as shown on the plans only when authorized by the Engineer.

Use care to prevent damage to any support structures. Any equipment or structure damaged or lost must be replaced by the Contractor (with items approved by the Engineer) at no cost to the Department.

Make all arrangements for connection to the power supply and communication source including any permits required for the work to be done under the Contract. Provide wire for the power connection at least the minimum size indicated on the plans and insulated for 600 V. Meet the requirements of the NEC, latest edition.

3.6. **Removal of RVDS Field Equipment.** Perform the removal in strict conformance with the requirements herein and as shown on the plans. Completion of the work will present a neat, workmanlike, and finished appearance. Maintain safe construction practices during removal.

Disconnect and isolate any existing electrical supply prior to removal of existing field equipment.

Use care to prevent damage to any support structures. Any equipment or structure damaged or lost must be replaced by the Contractor (with items approved by the Engineer) at no cost to the Department.

All materials not designated for reuse or retention by the Department will become the property of the Contractor and be removed from the project site at the Contractor's expense. Deliver items to be retained by the Department to a location shown on the plans or general notes. The Contractor is fully responsible for any removed equipment until released by the Engineer.

3.7. **Documentation.** Provide electronic copy operation and maintenance manuals, along with a copy of all product documentation on electronic media. Include the following documentation:

- Complete and accurate schematic diagrams,

- Complete installation procedures,
- Manufacturer's specifications (functional, electrical, mechanical, and environmental),
- Complete maintenance and trouble-shooting procedures, and
- Explanation of product operation.
- Warranty as specified in Section 3.8.

The RVDS must pass testing to ensure functionality and reliability prior to delivery. These include functional tests for internal subassemblies, a 24 hr. minimum unit level burn-in test, and a unit functionality test. Provide test results and supporting documentation, including serial number tested, must be submitted for each RVDS. If requested, manufacturing data per serial number must be provided for each RVDS.

Unless deemed unnecessary by the Project Engineer or TRF-TM, Provide certification from an independent laboratory demonstrating compliance with NEMA TS2 environmental requirements for temperature, humidity, transients, vibration, and shock.

Unless deemed unnecessary by the Project Engineer or TRF-TM, Provide third party enclosure test results demonstrating the sensor enclosure meets Type 4X criteria.

Unless deemed unnecessary by the Project Engineer or TRF-TM, Provide evidence of RVDS manufacturer's quality assurance program, including proof that the manufacturer of the RVDS is either ISO 9001 certified or other quality management system programs for manufacturing RVDS.

3.8. **Warranty.** Ensure that the detection system has a manufacturer's warranty covering defects for a minimum of 5 years from the date of final acceptance. In addition to the terms required by Article 8 of TO-8000, Ensure the warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department.

3.9. **Training and Support.** Provide manufacturer approved end user training to the Department and their representatives. Training must include instruction on system configuration, operation, and maintenance. Provide training for a minimum of 10 Department-designated representatives up to 8 hs., including both class and field training.

Ensure that the detection system manufacturer will provide product support for a minimum of 5 years from the date of final acceptance.

4. TESTING

Perform the following tests on equipment and systems unless otherwise shown on the plans. The Department may witness all the tests.

4.1. **Stand-Alone Test.** Conduct a Stand-Alone Test for each unit after installation. The test must exercise all stand-alone (non-network) functional operations and verify that RVDS is placing detector contact closure to assigned detector channels in the traffic signal controller assembly. Notify the Engineer 5 working days before conducting this test.

4.2. **Consequences of Test Failure.** If a unit fails a test, provide a new unit and then repeat the test until successfully completed.

4.3. **Final Acceptance Test.** Conduct a Final Acceptance Test on the complete functional system. Demonstrate all control, monitoring, and communication requirements and operate the system for 30 days. The Engineer will furnish a Letter of Approval stating the first day of the Final Acceptance Test.

4.4. **Consequences of Final Acceptance Test Failure.** If a defect within the system is detected during the Final Acceptance Test, document and correct the source of failure. Once corrective measures are taken, monitor the point of failure until a consecutive 30 day period free of defects is achieved.

4.5. Relocation

- 4.5.1. **Pre-Test.** Provide 5 copies of the test procedures to include tests of the basic functionality of the unit and blank data forms to the Engineer for review and comment as part of material documentation requirements. Functionality tests may include, but are not limited to, physical inspection of the unit and cable assemblies. Include the sequence of the tests in the procedures along with acceptance thresholds. The Engineer will comment, approve, or reject test procedures within 30 days after Contractor submittal of test procedures. Rejected test procedures must be resubmitted within 10 days. Review time is calendar days. Conduct all tests in accordance with the approved test procedures.

Conduct basic functionality testing prior to removal of RVDS field equipment. Test all functional operations of the equipment in the presence of representatives of the Contractor and the Department. Ensure that both representatives sign the test report indicating that the equipment has passed or failed each function. Once removed, the equipment becomes the responsibility of the Contractor until accepted by the Department. Compare test data prior to removal and after installation. The performance test results after relocation must be equal to or better than the test results prior to removal. Repair or replace those components within the system that failed after relocation but passed prior to removal.

- 4.5.2. **Post-Test.** Testing of the RVDS field equipment is to relieve the Contractor of system maintenance. The Contractor will be relieved of the responsibility for system maintenance in accordance with Item 7, "Legal Relations and Responsibilities" after a successful test period. The Contractor will not be required to pay for electrical energy consumed by the system.

After all existing RVDS field equipment has been installed, conduct approved continuity, stand alone, and performance tests. Furnish test data forms containing the sequence of tests including all the data taken as well as quantitative results for all tests. Submit the test data forms to the Engineer at least 30 days prior to the day the tests are to begin. Obtain Engineer's approval of test procedures prior to submission of equipment for tests. Send at least 1 copy of the data forms to the Engineer.

Conduct an approved stand-alone test of the equipment installation at the field sites. At a minimum, exercise all stand-alone (non-network) functional operations of the field equipment with all the equipment installed per the plans as directed by the Engineer. Complete the approved data forms with test results and turn over to the Engineer for review and either acceptance or rejection of equipment. Give at least 30 working days' notice prior to all tests to permit the Engineer or his representative to observe each test.

The Department will conduct approved RVDS field equipment system tests on the field equipment with the central equipment. The tests will, as a minimum, exercise all remote control functions and display the return status codes from the controller.

If any unit fails to pass a test, prepare and deliver a report to the Engineer. Describe the nature of the failure and the corrective action needed. If the failure is the result of improper installation or damage during reinstallation, reinstall or replace the unit and repeat the test until the unit passes successfully, at no additional cost to the Department or extension of the Contract period.

5. MEASUREMENT

New RVDS furnished and installed by the Contractor will be measured by each approach to the signalized intersection.

RVDS furnished by the Department for the Contractor to install only will be measured by each approach to the signalized intersection.

Existing RVDS to be relocated or removed will be measured by each sensor relocated or removed.

6. PAYMENT

- 6.1. **Furnish and Install.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit bid price for "RVDS (Presence Detection Only)", "RVDS (Advance Detection Only)" and "RVDS (Presence and Advance Detection)."

This price is full compensation for furnishing, installing, configuring, integrating, and testing the completed installation including RVDS equipment, voltage converters or injectors, cables, connectors, associated equipment, and mounting hardware; and for all labor, tools, equipment, any required equipment modifications for electrical service, documentation, testing, training, software, warranty and incidentals necessary to complete the work.

- 6.2. **Install Only.** The work performed and materials furnished in accordance with this Item will be paid for at the unit bid price for "RVDS (Presence Detection Only) (Install Only)", "RVDS (Advance Detection Only) (Install Only)" and "RVDS (Presence and Advance Detection) (Install Only)."

This price is full compensation for making fully operational a radar vehicle detection system furnished by the Department; installing, configuring, integrating, and testing the completed installation including RVDS equipment, voltage converters or injectors, cables, connectors, associated equipment, and mounting hardware; and for all labor, tools, equipment, any required equipment modifications for electrical service, documentation, testing, training, software, and incidentals necessary to complete the work.

- 6.3. **Relocate.** The work performed and materials furnished in accordance with this Item will be paid for at the unit bid price for "Relocate RVDS." This price is full compensation for relocating and making fully operational existing RVDS field equipment; furnishing and installing additional cables or connectors; for testing, delivery and storage of components designated for salvage or reuse; and all testing, training, software, equipment, any required equipment modifications for electrical service, labor, materials, tools, and incidentals necessary to complete the work.

- 6.4. **Remove.** The work performed and materials furnished in accordance with this Item will be paid for at the unit bid price for "Remove RVDS." This price is full compensation for removing existing RVDS equipment; removal of cables and connectors; for testing, delivery and storage of components designated for salvage; and all testing training, software, equipment, labor, materials, tools, and incidentals necessary to complete the work.

- 6.5. **Communication Cable.** All communication cables necessary to make the RVDS fully operational will be subsidiary to this Item.

ITEM 104

REMOVING OLD CONCRETE

104.1 Description. This Item shall govern for breaking up and satisfactorily disposing of concrete pavement, slope paving, riprap, median strips, driveways, sidewalks, combined curb and gutter, or curb.

104.2 Construction Methods. Existing concrete to be disposed of, consisting of pavement, slope paving, riprap, median strips, driveways, sidewalks, combined curb and gutter or curb, shall be removed and legally disposed of offsite. The use of explosives for breaking up old concrete will not be permitted, unless authorized by the Engineer, and when so authorized, adequate precautions shall be given to prevent damage to adjacent property. Reinforcing steel shall be cut as necessary for satisfactory disposal.

Where only a portion of the existing concrete is to be removed, special care shall be exercised to avoid damage to that portion of the concrete to remain in place. The existing concrete shall be cut to the neat lines shown on the plans or established by the Engineer and any existing concrete, beyond the neat lines so established, which is damaged or destroyed by these operations shall be replaced at the Contractor's entire expense. Saw-cutting, full depth or as shown on the drawings, will be required and shall be incidental to the removal of old concrete.

Where indicated on the plans, old concrete which is removed shall be loaded, hauled and disposed of at permitted locations outside the project limits, or used as needed for riprap onsite. Broken concrete reused as riprap onsite will be incidental to this Item. The Contractor shall provide the disposal locations and the total quantity of all excavated material, and the total quantity of disposed material. The disposal site shall not be an environmentally sensitive area, "Water of the United States", wetland, or floodway. It is the responsibility of the Contractor to contact the proper authorities to determine land use classification and to obtain any necessary permits. If the disposal site is defined in the plans, then the County shall be responsible for ensuring that the appropriate Department of the Army permit has been obtained for the activity, as necessary.

Work performed under this Item shall be initiated at such time and prosecuted in such a manner as to cause a minimum of inconvenience to traffic or adjacent property owners.

104.3 Measurement. Existing concrete pavements with or without curbs, slope paving, driveways, sidewalks, median strips, and riprap, removed as

prescribed above, will be measured by the square yard in its original position, regardless of its thickness or the depth of covering.

Existing combined concrete curb and gutter and concrete curb, not on concrete pavement, removed as prescribed above will be measured by the linear foot in its original position, regardless of the dimensions of same. Monolithic concrete curb or doweled-on concrete curb will be considered as part of the concrete pavement to be removed and will not be measured separately.

104.4 Payment. The work performed as prescribed by this Item, measured as provided under "Measurement" will be paid for at the unit price bid for "Removing Old Concrete" (of the type specified), which price shall be full compensation for:

A. Full depth saw-cutting or

B. Partial depth saw-cutting and breaking up the concrete,

cutting reinforcing steel when required, loading, hauling and disposing of the material offsite and for all labor, tools, equipment, manipulations and incidentals necessary to complete the work.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 205 "Subgrade"

END OF ITEM 104

ITEM 110

ROADWAY EXCAVATION

110.1 Description. This Item shall govern the required excavation within the roadway limits, including roadside ditches, and either of the following:

- A. proper re-use of the suitable material for embankment within project limits, or
- B. removal and disposal of excess or unsuitable excavated materials.

This Item includes stripping, constructing, shaping, and grading of all earthwork along the entire length of the roadway including approaches to the same. Both structural and channel excavation are excluded from this Item.

The roadway excavation shall conform to the required lines, grades and typical cross-sections as shown on the construction drawings, and conform to the requirements of this Item.

All suitable excavation material available at the time of need shall be used for embankment before using borrow material. Stripped material is unsuitable for re-use as embankment within the project. Compaction of embankments shall be as outlined in the Item 132 "Embankment".

The roadway limits are defined as being from right-of-way line to right-of-way line, and from beginning station to ending station.

110.2 Construction Methods. All roadway excavation and corresponding embankment construction shall be performed as specified herein and in accordance with the Item 132 "Embankment" and the completed roadway shall conform to the established alignment, grades and cross-sections.

All suitable excavated materials shall be utilized, insofar as practicable, for constructing the required roadway sections or embankments, flattening slopes, etc., or as directed by the Engineer. Materials suitable for onsite use shall be defined by the Engineer. Unsuitable roadway excavation and roadway excavation in excess of that needed for construction shall be considered as waste and shall become the property of the Contractor to be disposed of legally outside the project limits.

No disposal site(s) shall be located within an environmentally sensitive area, "Water of the United States", wetland, or floodway. It is the responsibility of the Contractor to contact the proper authorities to

determine land use classification and to obtain any necessary permits. If the disposal site(s) is defined in the plans, then the County shall be responsible for ensuring that the appropriate Department of the Army permit has been obtained for the activity, as necessary. Unsuitable material encountered below the top of subgrade elevation, shall be replaced with suitable material from the roadway excavation, or from other suitable material sources (see "Special Roadway Excavation below).

During construction, Item 560 "Maintenance and Cleanup of the Project Site" shall be implemented for the duration of the Contract. The roadbed and ditches shall be maintained in a condition to insure proper drainage at all times. Ditches shall be so constructed and maintained as to avoid damage to the roadway section.

All roadway excavation utilized as embankment shall be placed in accordance with Item 132 "Embankment".

In those cases where the Contractor has over-excavated beyond the lines and grades shown on the drawings, or designated by the Engineer, it shall be the Contractor's responsibility to replace the material and recompact it at his own expense. The material shall be replaced in accordance with the Item 132 "Embankment".

At the location of pipeline crossings, the Contractor shall suspend machine excavation at a location 5 feet before reaching the pipeline right-of-way, until a company representative is present to identify pipeline locations and to further direct excavation operations. The notification to the pipeline company of the Contractor's operations and the request for their representative's attendance shall be the responsibility of the Contractor. The Contractor shall not be reimbursed directly for any work or expenditure as a result of intersecting any pipeline operation. Any contingent costs therefore shall be anticipated in the preparation of the bid and included as distributed items of cost in the price for roadway excavation.

110.3 Special Roadway Excavation. When geotechnical conditions dictate, the Engineer may direct the Contractor to remove material which will not properly support the roadway, and replace it with suitable backfill material. Measurement will be by cubic yard of material as computed by volumetric calculations based on actual measured dimensions of the over-excavated area.

When Special Excavation is required by the Engineer, the cubic yardage calculated will be added to the plan quantity.

Payment shall include hauling, placing, compacting and any other incidentals necessary for completing the work. The backfill used to replace the unsuitable excavation shall be either of the following:

- A. suitable onsite material
- B. imported material, when directed by the Engineer, in accordance with sections 130.2 & 130.3 of Item 130 "Borrow" and shall be paid for as provided under "Borrow" The material shall be placed in accordance with the Item 132 "Embankment".

110.4 Contesting Earthwork Plan Quantities. For all earthwork items (110, 120, 130) that are designated as "plan quantity" pay items, the following procedures shall apply for contesting the plan quantities:

If, after project award, the Contractor believes there is an error in the estimated quantities for earthwork items as shown on the bid sheet, the Contractor shall provide, at no expense to Harris County, sufficient documentation in the form of recoverable cross-sections and supporting computations. If the Contractor is required to re-survey a portion of the project for the purpose of contesting the quantity shown on the plan, the cross-sections must be taken at the same locations and orientation of those presented in the plan set, and using the same control points. The quantities shall be determined using the Harris County Earthwork Quantities Worksheet. The Engineer shall, at the County's expense, designate a representative, either a Consultant's or Harris County's surveyor, to verify the re-survey process meets the above requirements. The Contractor's documentation shall be provided prior to proceeding with any items of earthwork. No adjustments to the plan quantity will be allowed once any excavation, including stripping, has begun.

The Contractor may submit a written notice of protest for earthwork at any time after the award date, but shall submit all required documentation no more than 30 calendar days after the latter of the following:

- A. Project start date, or
- B. Establishment of horizontal and vertical control points

If the documentation provided by the Contractor is deemed by Harris County to be sufficient, and is representative of actual field conditions, then the quantities derived there from shall be the basis of payment.

If the documentation provided by the Contractor is deemed by Harris County to be insufficient, additional supporting information may be required at no expense to Harris County. The Contractor shall submit the

additional documentation no more than 14 calendar days after being notified of the County's request.

Incentivized Project.

The time of early completion for receiving the incentive will not be extended on any incentivized project for any reason, including any time associated with a Contractor's protest of earthwork quantities. If the Contractor chooses to protest earthwork quantities on an incentivized project, and is successful in gaining acceptance of the revised earthwork quantities, he may be granted extra days on the project in the same manner discussed below for "Non-Incentivized Project" as well as revision of the plan quantity, but that result shall not affect the early completion incentive time as per the "Supplement to Harris County General Condition (For Roads, Bridges, and Related Work)".

Non-Incentivized Project.

If the Contractor's protest of earthwork quantities is accepted, the Contract Time may be adjusted for the contract time lost due to any of the following which falls after project start date:

- A. Contractor's time for submitting the original documentation after the project start date up to a maximum of 30 calendar days.
- B. Additional calendar days may be granted for any part of Harris County's original review period that occurs subsequent to the project start date.
- C. Any additional days which were required for providing additional documentation pursuant to Harris County's request, up to a maximum of 14 calendar days.
- D. Any additional days which were required for Harris County to review additional documentation and render a decision.

If the Contractor's protest of earthwork quantities is rejected, neither the Contract Time nor the plan quantity shall be adjusted.

- 110.5 Measurement and Payment. The quantity of excavation to be paid for shall be the number of cubic yards of material computed by theoretical cross-sections, obtained from the drawings and natural ground lines, including stripping, using the average end area method. This result represents a plan quantity amount that is paid for as such by the Roadway Excavation bid item.

With the exception of "Special Roadway Excavation" (as documented in Section 110.3) all work performed as required by this Item and measured as provided above, shall be paid for at the unit price bid for "Roadway Excavation", which price shall be full compensation for preparing and maintaining roadside ditches, trimming of slopes, hauling and storage of excavated material for other uses, disposal of unsuitable or surplus materials (wastage), preparation and completion of subgrade, shoulders, roadway, any necessary hauling, placing, compacting and the furnishing of all labor, tools, equipment and incidentals necessary to complete the work.

Re-grading of existing roadside ditches outside the limits of roadway excavation shall be measured in its original condition along the centerline and the total length be computed, in linear feet and shall be full compensation for furnishing all labor, supervision, supplies, materials, permits, and equipment required to complete the work, including all items of excavation, disposal, haul, compaction, grading, and ditch dressing as specified, in the project documents.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 130 "Borrow"

Item 132 "Embankment"

Item 200 "Stripping"

Item 205 "Subgrade"

Item 560 "Maintenance and Cleanup of the Project Site"

END OF ITEM 110

ITEM 120

EXCAVATION FOR CHANNELS AND OTHER DRAINAGE FACILITIES

NOTE: *This item is intended for use for constructing drainage facilities which will not be maintained by the Harris County Flood Control District. Facilities for Flood Control maintenance are governed by the applicable HCFCD standards.*

120.1 Description. This Item shall govern the required excavation for all channels, detention ponds, and other drainage facilities, channel changes and ditches as shown on the plans, the removal and proper stockpiling or disposal of all excavated materials; including strippings on the entire length of channel or drainage facility, in conformity with the required lines, grades and typical sections and in accordance with the specification requirements herein outlined. Stripping is unsuitable material. Excavation for roadways and roadside ditches are specifically excluded. Ditches shall include inlet and outlet ditches to structures, and all ditches outside the confines of the roadway slopes. This excludes constructing embankment for channels and ditches shall be as outlined under the Item 132 "Embankment".

120.2 Construction Methods. All suitable materials removed from the excavation shall be used, insofar as practicable in the formation of embankments as required by the Item 132 "Embankment". Excavated material shall neither be permanently nor temporarily placed on the channel top of bank, nor will temporary shelves be cut into the channel side slopes, without the approval of the Engineer. All channel excavation utilized as embankment shall be placed in accordance with Item 132 "Embankment".

Unsuitable and/or excess excavation shall become the property of the Contractor and shall be disposed of by the Contractor outside of the limits of the right-of-way. The Contractor shall be responsible for disposal of all excavated material not used for backfill or grading berm areas. The disposal site shall not be an environmentally sensitive area, "Water of the United States", wetland or floodway. It is the responsibility of the Contractor to contact the proper authorities to determine land use classification and to obtain any necessary permits. Refer to Section 120.3 regarding Disposal Permits. However, if the disposal site is defined in the plans, then the County shall be responsible for ensuring that the appropriate Department of the Army permit has been obtained for the activity.

Cut-off channel meanders shall not be backfilled unless so indicated on the plans.

Any temporary construction access that crosses a channel shall be constructed so as to allow a continuous flow at all times. The channel flow line shall not be blocked or raised at any temporary construction access. Temporary construction access across a channel shall require a permit. If a permit is not included in the contract, the Contractor is not entitled to construct such access without securing a required permit.

When the plans indicate the fill of a channel side slope, the earthen fill material shall be placed in layers not to exceed 8 inches and shall be benched or notched into existing slopes and compacted by suitable rolling equipment to 90 percent of standard proctor density, per ASTM D698 "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort of (12,400 ft-lbf/ft³)" at a moisture content between +/- three percent of optimum.

Any earthen fill material, whether from onsite sources or imported, shall be free from roots, trash, silt and objectionable debris. Soils classified by ASTM D2487 "Standard Practice for Classification of Soils for Engineering Purposes" as clayey sands (SC), sand clay mixtures, or inorganic clays (CL) with a plasticity index from 15 to 40 are approved as fill materials. Each layer shall be compacted to 90 percent of standard proctor density (ASTM D698), at a moisture content between +/- three percent of optimum. The channel side slopes, in fill areas, shall be cut to the finished dimensions after completion of the fill process. Any imported earthen fill material shall comply with Item 130 "Borrow".

At the location of pipeline crossings, the Contractor shall suspend machine excavation at a location five feet before reaching the pipeline right-of-way, until a company representative is present to identify pipe location and to further direct excavation operations. The notification to the pipeline company of the Contractor's operations and the request for their representative's attendance shall be the responsibility of the Contractor. The Contractor shall not be reimbursed directly for any work or expenditure as a result of intersecting any pipeline operation. Any contingent costs therefore shall be anticipated in the preparation of the bid and included as distributed items of cost in the price for channel excavation.

At locations where lateral ditches or swales enter the channel, the Contractor shall perform grading as may be required to maintain the lateral ditches or swales within the easement area as approved by the Engineer. The cost of all grading shall be considered incidental to the unit price bid and no extra payment will be made.

Prior to final inspection by the Engineer, the Contractor shall remove all sediment from the bottom of the channel and dispose of this material off site. The cost of sediment removal and grading shall be incidental to the unit price bid, and no extra payment will be made.

120.3 Disposal Permits. The Contractor shall provide copies of the disposal permits to the County and post all disposal location permits on the jobsite.

120.4 Measurement & Payment. The quantity of excavation for channels and other drainage facilities shall be paid for by the number of cubic yards of material computed by theoretical cross-sections, obtained from the drawings and natural ground lines using the average end area method. Field cross-sections will not be performed after construction has begun. Excavation in Storm Water Quality basins and created wetlands may be paid for per cubic yard or per acre as stipulated in the bid proposal and/or drawings.

After project award, if the Contractor feels there is an error in the estimated quantities for excavation, as shown on the bid sheet, the plan quantity may be protested as delineated in Item 110.4 "Contesting Earthwork Quantities".

All work performed as required by this Item and measured as provided above, will be paid for at the unit price bid for excavation for channels and other drainage facilities which price shall be full compensation for preparation, trimming of slopes, storage and hauling of excavated material for other uses, disposal of surplus materials (wastage), any necessary hauling and the furnishing of all labor, tools, equipment and incidentals necessary to complete the work, as shown on the drawings.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 110 "Roadway Excavation"

Item 130 "Borrow"

Item 132 "Embankment"

Item 200 "Stripping"

END OF ITEM 120

ITEM 165

HYDRO-MULCH SEEDING
(FOR EROSION CONTROL AND STABILIZATION)

165.1 Description. This Item shall govern for furnishing all labor, materials, equipment, supplies, supervision and tools and performing all work necessary to:

- A. seed,
- B. fertilize,
- C. water,
- D. maintain, and
- E. cleanup of side slopes and finished grades,

in accordance with these Standard Specifications, for the purpose of temporary erosion control or final stabilization.

The hydro-mulch seeding operations, together with all necessary related work, shall conform to the requirements specified in this section. The area(s) to be hydro-mulch seeded shall be as shown on the construction drawings.

165.2 Materials. Seed shall comply with the U. S. Department of Agriculture Rules and Regulations – Federal Seed Act. Seed bags shall have tags affixed for inspection in the field. Bags without tags will be rejected. Seed shall be tested and certified by a commercial or state laboratory not more than nine (9) months prior to the date of planting. Tags on seed bags shall show the name of the seed, locality and year of harvest, percentage purity, germination and dormant seed, Johnson grass content and noxious weed content. Seed shall be provided in clean, unopened and undamaged bags. Seed(s) shall be provided with no objectionable material, such as sticks, stems and unthreshed seed heads, which will hinder proper distribution. Seed that is wet, moldy, starting to germinate or otherwise damaged, will not be accepted by Harris County.

Standard seed plan, planting Dates, plant species and seeding rate are as shown on Table 1:

TABLE 1

<u>SEED PLAN</u>	<u>PLANTING DATES¹</u>	<u>SPECIES</u>	<u>PLANTING RATE PER ACRE</u>
<u>1</u>	<u>Oct. 1- March 31 (When soil temperatures fall below 75°F, or as directed)</u>	<u>Unhulled Bermuda Grass Tall Fescue and Durana Clover Crimson Clover</u>	<u>50 lbs. 25 lbs. 5 lbs. 5 lbs.</u>
<u>2</u>	<u>April 1-Sept. 30 (When soil temperatures rise above 65°F, or as directed)</u>	<u>Certified Bermuda Grass² or Common Bermuda Grass, minimum purity/germination of 95/85 Millet</u>	<u>50 lbs. or 50 lbs. PLS³ 10 lbs.</u>
<u>3</u>	<u>As directed</u>	<u>Certified Bermuda Grass² or Hulled Bermuda Grass minimum purity/germination 95/85 and Pensacola Bahia Grass Brown Top or Fox Trail Millet</u>	<u>50 lbs. or 50 lbs. PLS³ and 20 lbs. 20 lbs.</u>
<u>5</u>	<u>As directed</u>	<u>Annual Ryegrass and Fescue or Millet</u>	<u>25 lbs. each 25 lbs.</u>
<u>6</u>	<u>As directed</u>	<u>Improved Bermuda Grass Cultivars</u>	<u>50 lbs.</u>
<u>7</u>	<u>As directed</u>	<u>Legume or Grain</u>	<u>20 lbs.</u>

1. Planting dates are approximate, Harris County will determine which seed to use prior to start of seeding
2. Certified Bermuda Grass must have a Blue Tag and tested by an accredited seed testing lab.
3. Seeding rate for "Pure Live Seed" (PLS) is used to determine the actual application rate of bulk material to obtain.
 - a. Calculate PLS: PLS = (% germination x % purity)
0.95 x 0.85 = 0.807 (80.7%) PLS
 - b. Calculate quantity: Rate ÷ PLS = lbs. of seed needed for application
50 lbs. ÷ 0.807 = 61.95 lbs. of seed needed per acre

Commercial fertilizer as outlined in the Item 166 "Fertilizer", shall be applied to the entire seeded area at the prescribed rates. The fertilizer shall be delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable State Fertilizer Laws and bearing the name and warranty of the producer.

Mulch shall be virgin wood cellulose fiber made from whole wood chips. Rate of application shall be 2000 pounds per acre. Soil stabilizers shall be applied at a rate of 40 pounds per acre. On side slopes Terra Type III (or approved equal) shall be used. On all other areas Terra Tack I (or approved equal) shall be used. Alternatively, Ultra Bond 2002 (or approved equal) shall be applied at a rate of one gallon per square yard in three applications. First application shall be at a rate of 1/2 gallon per square yard followed by another application in about two weeks at a rate of 1/4 gallon per square yard. The third application shall follow in about two months at a rate of 1/4 gallon per square yard. The concentrate shall be diluted in 1:5 ratio with water or as recommended by the manufacturer.

Wood cellulose fiber mulch, for use in the grass seed and fertilizer, shall be processed in such a manner that it will not contain any germination or growth inhibiting factors. It shall be dyed an appropriate color to allow visual metering of its application. The wood cellulose fibers shall have the property of becoming evenly dispersed and suspended when agitated in water. When sprayed uniformly on the surface of the soil, the fibers shall form a blotter-like ground cover which readily absorbs water and allows infiltration to the underlying soil. Weight specifications from suppliers, shall refer only to the air dry weight of the fiber. The mulch material shall be supplied in packages having a gross weight not greater than 100 pounds and must be marked by the manufacturer to show the dry weight content. Suppliers shall be prepared to certify that laboratory and field testing of their product has been accomplished and that it meets all of the preceding requirements.

Water shall be free from oil, acid, alkali, salt and other substances harmful to the growth of grass. The water source shall be subject to approval, prior to use.

165.3 Execution. Immediately after the finished grade has been approved, begin hydro-mulching operations to reduce erosion and excessive weed growth.

Hydraulic equipment used for the application of fertilizer, seed and slurry of prepared wood fiber mulch shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing up to 40 pounds of fiber plus a combined total of 70 pounds of fertilizer solids for each 100 gallons of water. The slurry

distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles which provide even distribution of the slurry on the area to be seeded. The slurry tank shall have a minimum capacity of 800 gallons and shall be mounted on a traveling unit, which may either be self-propelled or drawn with a separate unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded, so as to provide uniform distribution without waste. The Engineer may authorize equipment with a smaller tank capacity, provided the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat.

Slurry preparation shall take place on the worksite. The slurry preparation should begin by adding water to the tank when the engine is at half throttle. When the water level has reached the height of the agitator shaft, good re-circulation shall be established and seed shall be added. Fertilizer shall then be added, followed by wood pulp mulch. The wood pulp mulch shall only be added to the mixture after the seed and when the tank is at least one-third filled with water. The engine throttle shall be opened to full speed when the tank is half filled with water. All the wood pulp mulch shall be added by the time the tank is two-thirds to three-fourths full. Spraying shall commence immediately when the tank is full. The operator shall spray the area with a uniform visible coat, by using the green color of the wood pulp as a guide.

- 165.4 Application. The Contractor shall obtain approval of hydro-mulch area preparation from the Engineer prior to application. If rain is imminent, then the application of hydromulch seeding and fertilizer shall be postponed until weather conditions exist such that the potential for the runoff of the slurry and fertilizer from the site is minimized.

Operators of hydro-mulching equipment shall be thoroughly experienced in this type of application. Apply the specified slurry mix to form a uniform mat at the specified rate. The Contractor shall avoid getting the hydromulch on paved areas. Keep paved and planting areas clean during maintenance operations. Contractor shall confine hydro-mulching within the areas designated on the plans and keep it from contact with other plant material. Immediately after application, thoroughly wash off any plants, planting areas or paved areas not intended to receive slurry mix.

If the Engineer notes any unmulched areas after hydro-mulching, the Contractor shall be required to seed the unmulched areas with the grasses that were to have been planted at no additional cost to Harris County.

- 165.5 Contractor's Maintenance & Guarantee Period. It shall be the responsibility of the Contractor to maintain all hydromulch seeded areas until satisfactory growth has occurred as determined by the Engineer and for 60 days after the successful completion of all punch list items. Maintenance shall consist of watering, weeding, repairing of all erosion, and reseeding, as necessary to establish a uniform stand of the specified grasses. A minimum of 95 percent of the area seeded shall be covered with the specified grass with no bare or dead spots greater than 10 square feet. The Contractor shall make as many repeat seedings as necessary to achieve the required level of coverage. Such reseeding is to be performed within 14 calendar days of notification by the Engineer.
- The Contractor shall be responsible for 1 mowing per month in the months of April through October. The Contractor shall also be responsible for 1 mowing every 6 weeks in the months of November through March. In addition, the Contractor shall water all grassed areas as often as necessary to establish satisfactory growth and to maintain its growth throughout the duration of the project; including the 60 day period after the punch list is completed as described above.
- 165.6 Submittal Required. The Contractor shall submit copy of seed tag(s) and letter from the supplier attesting that the seed meets the requirements as stated herein. Certification shall include common name; botanical name, percent by weight of each plant species; year of harvest; percent purity, germination and dormant seed; percent noxious weed content; and date of certification. The Contractor shall certify on the application of the project.
- 165.7 Measurement. The unit of measurement for all work performed and materials furnished, as described herein, shall be by the acre or per station as indicated in the bid documents. Measurement shall be done upon completion of the work performed within the limits shown on the drawings and as described herein. The area measured for payment will be computed to the nearest 1/10 acre or station.
- 165.8 Payment. Payment for hydro-mulch seeding will be made at the contract unit price per acre or per station and includes final grading, mulch, seed, fertilizer, watering, maintenance and clean-up. Additional payment shall not be made for those areas that are reseeded as provided in Section 165.5 above.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications.

Item 166 "Fertilizer"
Item 725 "General Source Controls (SWPPP)"

END OF ITEM 165

ITEM 220

LIME STABILIZED SUBGRADE

- 220.1 Description. Mix and compact lime, water and subgrade in the roadway.
- 220.2 Materials. Furnish uncontaminated lime of uniform quality that meets the requirements of the plans and specifications. Notify the Engineer in writing of the proposed lime source and of any proposed change in lime source. The Contractor shall obtain verification from the Engineer that the specification requirements are met before using the lime source. The Engineer may sample and test lime or lime/subgrade mixture at any time before compaction.
- A. Lime. Furnish lime that meets the requirements of TxDOT's DMS-6350 "Lime and Lime Slurry," and DMS-6330, "Lime Sources Prequalification of Hydrated Lime and Quicklime." Use hydrated lime slurry as shown on the plans.
 - B. Water. Furnish water free of industrial wastes and other objectionable material.
 - C. Asphalt. When permitted for curing purposes, furnish asphalt or emulsion in accordance with TxDOT's Item 300, "Asphalts, Oils, and Emulsions," as shown on the plans or as directed.
 - D. Mix Design. The Engineer shall determine the target lime content and optimum moisture content in accordance with ASTM D698 "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))" or based upon prior experience with the project materials. The Contractor may propose an alternative mix design developed in accordance with ASTM D698. The Engineer shall use ASTM D698 to verify the Contractor's proposed mix design before accepting it. The Contractor shall reimburse the County for any and all expenses incurred due to a request by the Contractor to change of mix designs or partial designs, material sources, etc. whether they are approved or not.
- 220.3 Equipment. Provide machinery, tools, and equipment necessary for proper execution of the work. Provide rollers in accordance with TxDOT's Item 210 "Rolling." Provide proof rollers in accordance with TxDOT's Item 216 "Proof Rolling" when directed.

- A. Slurry Equipment. Use slurry tanks equipped with agitation devices to slurry hydrated lime at the jobsite or any 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.
- B. Pulverization Equipment. Provide pulverization equipment that:
 - 1. cuts and pulverizes material uniformly to the proper depth with cutters that plane to a uniform surface over the entire width of the cut,
 - 2. shows a visible indication of the depth of cut at all times, and
 - 3. mixes the materials uniformly.

220.4 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 for Treatment. Shape the subgrade in accordance with Item 205 "Subgrade", and applicable bid items to conform to typical sections shown on the plans and as directed. The Contractor shall pulverize or scarify the existing raw subgrade sufficiently to allow penetration of the lime to the required depth.
- B. Pulverization. The Contractor shall pulverize or scarify the existing raw subgrade to allow penetration of the lime to the required depth.
- C. Application of Lime. Uniformly apply lime using slurry placement as shown on the plans or as directed. Add lime at the percentage determined in Section 220.2.D, "Mix Design" above. 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 shall be taken in the shade and away from artificial heat. Suspend application when the Engineer determines that weather conditions are unsuitable.

Slurry Placement. Provide slurry free of objectionable materials, at or above the approved minimum dry solids content, and with a uniform consistency that shall 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 as specified.

Distribute slurry uniformly by making successive passes over a measured section of subgrade until the specified lime content is reached.

- 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, shall not be accepted for payment.

Thoroughly mix the subgrade and lime using approved equipment. Allow the mixture to mellow for 1 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 treated subgrade is obtained.

After mixing, the Engineer shall 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	TREATED SUBGRADE
1-3/4 Inch	100
3/4 Inch	85
No.4	60

- E. Compaction. Compact the treated subgrade using density control. Multiple lifts are permitted when shown on the plans or approved. Bring each layer to the moisture content directed. When necessary, sprinkle the treated subgrade as directed. Determine the moisture content of the treated subgrade at the beginning and during compaction in accordance with ASTM D698.

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. Offset alternate trips of the roller. Operate rollers at a speed between 2 and 6 MPH, as directed.

Rework, recompact, and refinish treated subgrade that fails to meet or that loses required moisture, density, stability, or finish before the next layer is placed or the project is accepted. Continue work until specification requirements are met. Rework in accordance with Section 220.4.F, "Reworking a Section" below. Perform the work at no additional expense to the County.

The Testing Laboratory shall determine treated subgrade density of completed sections in accordance with ASTM D6938 "Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)." The minimum level of testing shall consist of the following:

1. at least one test per station per lane of roadway.
2. a lane is defined as 12' wide section of pavement regardless of its use.

Compact to at least 95% of the maximum density as determined in accordance with ASTM D698, unless otherwise shown on the plans.

- F. Reworking a Section. When a section of lime treated subgrade 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 hours after completion of compaction, add additional lime at 25% of the percentage determined in Section 220.2.D, "Mix Design" at no additional cost to the County. Reworking includes loosening, adding lime or removing unacceptable treated subgrade if necessary, mixing as directed, compacting, and finishing. Determine a new maximum density of the reworked treated subgrade in accordance with ASTM D698, and compact to at least 95% of this density.
- G. Finishing. Immediately after completing compaction of the final layer of lime treated subgrade, clip, skin, or tight-blade the surface to a depth of approximately $\frac{1}{4}$ in. Remove the clipped material and dispose of it 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 layer and surface in conformity with the typical sections, lines, and grades shown on the plans or as directed. The treated subgrade shall be finished within the tolerances required by TxDOT's Item 132.3.6.1, "Grade Tolerances."

- H. Curing. Cure for the minimum number of days shown in Table 2 by sprinkling as per TxDOT's Item 204 "Sprinkling", or by applying an asphalt material at a rate of 0.05 to 0.20 gal. per square yard as directed. Maintain moisture content during curing. Upon completion of curing, maintain the moisture content in accordance with TxDOT's Item 132.3.5, "Maintenance of Moisture and Reworking" for treated subgrade prior to placing subsequent courses. Do not allow equipment on the finished layer during curing except as required for sprinkling, unless otherwise approved. Apply seals or additional layers or surface course within 14 calendar days of final compaction.

TABLE 2

MINIMUM CURING REQUIREMENTS BEFORE PLACING
SUBSEQUENT LAYERS¹

ORIGINAL (UNTREATED) SUBGRADE PI	CURING (DAYS)
PI ≤ 35	2
PI > 35	5

1. Subject to the approval of the Engineer. Proof rolling may be required as an indicator of adequate curing.

220.5 Measurement.

- A. Lime. When lime is furnished in trucks, the weight of lime shall be determined on certified scales.

When lime is furnished in bags, indicate the manufacturer's certified weight. Bags varying more than 5% from that weight may be rejected. The average weight of bags in any shipment, as determined by weighing 10 bags taken at random, must be at least the manufacturer's certified weight.

Hydrated Lime slurry shall be measured as per Item 221 "Hydrated Lime and Lime Slurry".

- B. Lime Treatment. Lime treatment shall be measured by the square yard of surface area at the specified depth. The dimensions for determining the surface area are established by the widths shown on the plans and the lengths measured at placement.

220.6 Payment.

Lime Treatment. Lime treatment shall be paid for at the unit price bid for "Lime Treatment" by the square yard for the depth specified. This price is full compensation for shaping existing material, loosening, mixing, pulverizing, spreading, applying lime, compacting, finishing, curing, blading, shaping and maintaining, replacing, disposing of loosened materials, processing, hauling, preparing secondary subgrade, water, equipment, labor, tools, and incidentals.

Water for sprinkling. Sprinkling and rolling shall not be paid for directly, but shall be subsidiary to this Item, unless otherwise shown on the plans. Amendment of treated subgrade to correct soft spots shall be at the Contractor's expense.

Asphalt used solely for curing will not be paid for directly, but will be subsidiary to this Item. Asphalt placed for curing and priming will be paid for under Item 310, "Prime Coat/Sealer."

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 130 "Borrow"

Item 205 "Subgrade"

Item 221 "Hydrated Lime and Lime Slurry"

Item 310 "Prime Coat/Sealer"

END OF ITEM 220

ITEM 221

HYDRATED LIME AND LIME SLURRY

221.1 Description. This Item shall govern for establishing the requirements for hydrated lime and commercial lime slurry of the type and grade considered suitable for use in the treatment of natural or processed materials or mixtures for subgrade, sub-base and base construction.

221.2 Materials. The various types and grades are defined and identified as follows:

- A. Type A. Hydrated Lime: Shall consist of a dry powder obtained by treating quicklime with enough water to satisfy its chemical affinity for water under the conditions of its hydration. This material is to consist essentially of calcium hydroxide or a mixture of calcium hydroxide and a small allowable percentage of calcium oxide, magnesium oxide and magnesium hydroxide.

When sampled and tested according to TxDOT's prescribed Tex-600-J procedures, hydrated lime shall conform to the requirements of TxDOT's DMS-6350. Hydrated Lime for stabilization purposes shall be applied, as provided in the governing specifications, as a dry powder or mixed with water to form a slurry at the jobsite.

- B. Type B. Commercial Lime Slurry: Shall be pumpable suspension of solids in water. The water or liquid portion of the slurry shall not contain dissolved material in sufficient quantity or nature that would be injurious for the purpose intended. The solids portion of the mixture, when considered on the basis of "solids content", shall consist principally of hydrated lime of a quality and fineness sufficient to meet TxDOT's DMS-6350.

221.3 Sampling and Testing. The sampling and testing of lime slurry shall be as determined by Test Procedure Tex-600-J, "Sampling and Testing Lime".

When Hydrated Lime is used, the quantity of lime will be measured by the ton of 2000 pounds, dry weight.

When Commercial Lime slurry is used, the quantity of lime shall be calculated from the required minimum percent solids based upon the use of Grade 1, Grade 2, or Grade 3 as follows:

Grade 1: The "Dry Solids Content" shall be at least 31 percent by weight of the slurry and the quantity of lime will be calculated by the ton of 2,000 pounds based on the 31 percent dry weight solids.

Grade 2: The "Dry Solids Content" shall be at least 35 percent by weight of the slurry and the quantity of lime will be calculated by the ton of 2,000 pounds based on the 35 percent dry weight solids.

Grade 3: The "Dry Solids Content" shall be at least 46 percent by weight of the slurry and the quantity of lime will be calculated by the ton of 2,000 pounds based on the 46 percent dry weight solids.

221.4 Measurement and Payment. Work performed and materials furnished as prescribed by this Item will be paid for at the unit price bid per ton of 2,000 pounds, dry weight for "Lime", of the type specified, which price shall be full compensation for supplying the lime, for all mixing, spreading, drying, application of the lime, water content of the slurry, for all manipulations required, for all hauling, and freight involved, for all tools, equipment, labor and for all incidentals necessary to satisfactorily complete the work.

There are line code(s), description(s), and unit(s) for this Item.

END OF ITEM 221

ITEM 360

CONCRETE PAVEMENT

- 360.1 Description. This Item shall govern for a pavement of portland cement concrete with reinforcement. The pavement shall be as shown on the drawings, and may or may not include monolithic curbs. The pavement includes any driveways that are included in the project bid.

The pavement shall be constructed as herein specified on the prepared subgrade or other base course in conformity with the thickness and typical cross-sections shown on the drawings, and to the lines and grades established by the Engineer. All materials shall be provided from an approved Texas Department of Transportation (TxDOT) supplier and it shall be the responsibility of the Contractor to provide certification that such approval has been met. In addition, other tests or approvals may be required at the discretion of the Engineer.

- 360.2 Materials. Harris County's standard mix design shall contain minimum 5-1/2 sacks (94 pounds per sack) of cementitious material (including fly ash as necessary) per cubic yard and achieve a minimum compressive strength of 3,000 psi at 28 days.

The use of fly ash is acceptable and when used, the mix design shall contain 5-1/2 sacks of cementitious material per cubic yard with a fly ash content of not more than 25 percent by weight, and will achieve a minimum compressive strength of 3,000 psi at 28 days. It is recommended that the percent of fly ash by weight be reduced to a maximum of 20 percent during cold weather concreting (average ambient temperature, over a 24 hour period after placement, less than 50° F). Fly ash shall be Class C or Class F, conforming to the requirements of ASTM C618 "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete." Fly ash shall have a minimum combined Oxide content of 50 percent for Class C or 70 percent for Class F. Do not use Class C fly ash in sulfate-resistant (Type II cement) concrete.

"High Early Strength Concrete" shall contain 7 sacks of portland cement (only) per cubic yard and may be produced from either Type I, Type II, or Type III portland cement with other chemical admixtures.

Concrete Components:

Concrete shall be composed of portland cement, fly ash (if required), water, chemical admixtures and coarse and fine aggregates, as outlined below:

- A. Portland cement shall meet the requirements of ASTM C150 "Standard Specification for Portland Cement." Unless otherwise permitted or required, cement shall be Type I, Type II, or Type III.
- B. Fly Ash for concrete pavement (if applicable) shall meet the requirements of TxDOT's DMS-4610, "Fly Ash." Fly ash is not allowed for use in High Early Strength Concrete.
- C. Mixing water for concrete shall conform to the requirements of ASTM C1602 "Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete."
- D. Chemical admixtures shall conform to the following specifications:
 - 1. Air-entraining admixtures shall conform to the requirements of ASTM C260 "Standard Specification for Air-Entraining Admixtures for Concrete"
 - 2. Chemical admixtures shall conform to the requirements of ASTM C494 "Standard Specification for Chemical Admixtures for Concrete."
- E. Aggregates shall conform to ASTM C33 "Standard Specification for Concrete Aggregates."

Coarse aggregate shall consist of durable particles of gravel, crushed stone, or combinations thereof, free from frozen material or injurious amounts of salt, alkali, vegetative matter, or other objectionable material either free or as an adherent coating, and its quality shall be reasonably uniform throughout. It shall contain no more than 0.25 percent by weight of clay lumps and not more than 1.0 percent by weight of laminated and/or friable particles. When tested by ASTM C136 "Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates" and C117 "Standard Test Method for Minerals Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing", it shall meet the following grading requirements:

TABLE 1

COARSE AGGREGATE GRADATION

SIEVE SIZE	% RETAINED, BY WEIGHT
1-3/4 Inch	0
1-1/2 Inch	0 – 5

SIEVE SIZE	% RETAINED, BY WEIGHT
3/4 Inch	30 – 65
3/8 Inch	70 – 90
No. 4	95 – 100

The loss by decantation shall be a maximum of 1 percent

- F. Fine aggregate shall consist of clean, hard, durable and uncoated particles of natural or manufactured sand or a combination thereof, with or without mineral filler. It shall be free from frozen material, or injurious amounts of salt, alkali, vegetative matter or other objectionable material and it shall not contain more than 0.5 percent, by weight, of clay lumps. When subjected to the color test for organic impurities, ASTM C40 “Standard Test Method for Organic Impurities in Fine Aggregates for Concrete”, the fine aggregate shall show a color not darker than the standard.

Unless otherwise specified, fine aggregate shall meet the following grading requirements:

TABLE 2

FINE AGGREGATE GRADATION

SIEVE SIZE	% RETAINED BY WEIGHT
3/8 Inch	0
No. 4	0 – 5
No. 8	0 – 20
No. 16	15 – 50
No. 30	35 – 75
No. 50	65 – 90
No. 100	90 – 100
No. 200	97 – 100

Fine aggregate shall be subjected to ASTM D2419 “Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate”. The sand equivalent shall be not less than 80.

Mineral filler shall consist of stone dust, clean crushed sand or other approved inert material.

Reinforcing Steel:

Unless otherwise designated on the drawings, or herein, all bar reinforcement shall be deformed and shall conform to ASTM A615 "Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement", Grade 60, open hearth, basic oxygen or electric furnace new billet steel. The use of Grade 40 is permissible for bars that must be bent. The use of prefabricated deformed steel bar mats, conforming to ASTM A184 "Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement", is not permitted.

Tie bars (including L-bars) shall be the same spacing and diameter as the transverse or longitudinal bars (as the case may be), and shall be tied to the transverse or longitudinal reinforcing steel being used in the pavement. Tie bars shall be a minimum of 30 inches in length. Type III adhesives meeting the requirements of TxDOT Material Specification DMS-6100 "Epoxy and Adhesives" shall be used for installing drilled-in reinforcing steel and dowels, into the existing concrete pavements.

Expansion Joints:

Boards for expansion joint filler shall be 3/4 inch finished thickness. The material for the boards shall consist of "All Heart Merchantable Redwood" or composite material as approved by the Engineer. The joint filler shall meet the testing requirements of ASTM D545 "Standard Test Methods for Preformed Expansion Joint Fillers for Concrete Construction (Non-extruding and Resilient Types)."

If the joint filler used is a bituminous composite, it shall meet the requirements of ASTM D1751 "Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)."

Joint sealant shall meet the requirements of ASTM D6690 "Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements", Type II or III. Joint sealant for expansion joints shall be installed 1/4 inch below the top of pavement elevation. Prefabricated expansion joints may be used with approval by the Engineer.

Load transmission devices shall consist of an 18 inch smooth dowel placed as shown on the Standard Civil Drawing. The dowel size varies with pavement thickness as shown on the Concrete Pavement Details of the Harris County Standard Civil Drawings. Dowels may be sheared or saw cut to the desired length.

360.3

Storage of Materials. Cement shall be stored in well ventilated weathertight buildings, bins, or silos which shall exclude moisture and contaminants.

Aggregate stockpiles shall be arranged and used in such a manner as to avoid contamination, with other materials or with other sizes of like aggregates. To ensure that this condition is met, any test for determining conformance to requirements for cleanliness and grading shall be performed on samples secured in accordance with ASTM D75 "Standard Practice for Sampling Aggregates." Frozen or partially frozen aggregates shall not be used. Unless otherwise authorized by the Engineer, all aggregate shall be stockpiled at least 24 hours prior to use, to reduce free moisture content.

Chemical admixtures shall be stored in such a manner as to avoid contamination, evaporation, or damage. For those used in the form of suspensions or non-stable solutions, agitating equipment shall be provided to assure thorough distribution of the ingredients. Liquid admixtures shall be protected from freezing and from temperature changes which would adversely affect their characteristics.

- 360.4 Proportioning of Concrete. Concrete for all parts of the work shall be of the specified quality, capable of being placed without excessive segregation and, when hardened, shall develop all characteristics required by this Item and the contract documents.

The specified compressive strength of the concrete, for each portion of the structure, shall be as designated in the contract documents. Strength requirements shall be based on the 28 day and 7 day compressive strength, respectively.

- 360.5 Concrete Classification. Concrete shall be classified as shown in Table 3 of Item 421 "Structural Concrete".

- 360.6 Selection of Proportions. Proportions of materials for concrete shall be established to provide:

- A. Workability and consistency to permit concrete to be worked readily into forms and around reinforcement under conditions of placement to be employed without segregation or excessive bleeding.
- B. Strength requirements in accordance with Table 3 of Item 421.
- C. Resistance to special exposure as required by the Engineer and as specified in the contract documents or in Special Provisions.

Unless otherwise permitted, the concrete mix design shall be proportioned to provide a slump between 1 and 6 inches. A slump range of 1 to 3-1/2 inches shall be used for concrete placed with a slip form paver, while

vibrated concrete shall have a slump range of 2-1/2 to 6 inches, when tested in accordance with ASTM C143 "Standard Test Method for Slump of Hydraulic-Cement Concrete." A slump test will be made for each sample of concrete obtained, or when slumps appear to be outside specification requirements. The allowable air content for moderate exposure is:

AGGREGATE SIZE	% AIR CONTENT
1-1/2 Inch	2.5 - 4.5
3/4 Inch	3.5 – 5.0

The Engineer may reject any concrete shown to be outside of these requirements.

All concrete pavement shall have a minimum design compressive strength of 3,000 psi at 28 days. A minimum of 4 test cylinders shall be made for each 150 cubic yards, or portion thereof, placed each day. Samples shall be taken in accordance with ASTM C172 "Standard Practice for Sampling Freshly Mixed Concrete" and molded and cured in accordance with ASTM C31 "Standard Practice for Making and Curing Concrete Test Specimens in the Field."

All test specimens shall be prepared in accordance with ASTM C617 "Standard Practice for Capping Cylindrical Concrete Specimens" and tested in accordance with ASTM C39 "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens." Two specimens shall be tested at 7 days and two specimens shall be tested at 28 days. The acceptance test results shall be the average of the two specimens tested for each age interval. If one specimen in a test age indicates evidence of improper sampling, handling, molding or testing, it shall be discarded and the strength of the remaining specimen shall be considered the test result. Should both specimens in a test interval show any of the aforementioned defects, the Engineer may request that cores be taken in the affected area.

Additional test specimens may be required due to concrete placing conditions and due to use of high early strength concrete. No extra compensation shall be allowed for materials and work involved in fulfilling these requirements.

360.7 Equipment. All equipment necessary for the construction of concrete pavement shall be on the job and shall have been approved by the Engineer as to condition, before the Contractor will be permitted to begin construction operations on which the equipment is to be used.

Side forms shall be of metal of approved cross-section. The preferred depth of the form shall be equal to the required edge thickness of the pavement. Forms with depths less than the required edge thickness of the pavement will be permitted, provided the difference between the form depth and the edge thickness is not greater than 1 inch, and further provided that forms of a depth, less than the pavement edge are brought to the required edge thickness by securely attaching wood or metal strips, of approved section, to the bottom of the form, or by grouting under the form.

The length of form sections shall be not less than 10 feet and each section shall provide for staking in position with not less than 3 pins. Flexible or curved forms of wood or metal of proper radius shall be used for curves of 100 foot radius or less. Forms shall be of ample strength and shall be provided with adequate devices for secure setting so that when in-place they will withstand without visible springing or settlement, the impact and vibration of the finishing machine. The forms shall be free from warp, bends or kinks and shall be sufficiently true to provide a reasonably straight edge on the concrete. The top of each form section, when tested with a straight edge, shall conform to the requirements specified for the surface of the completed pavement. Sufficient forms shall be provided for satisfactory prosecution of the work.

A minimum of two hand vibrators is required at the jobsite when placing concrete. A hand vibrator shall be used around all load transfer devices and intersections where screeds or slip form pavers cannot be operated.

Pavement shall be finished by machine, except as hereinafter provided. Placement shall be the Contractor's responsibility and shall be based upon equipment sequences utilized in accordance with the recommendations and practices of ACI 304R "Guide for Measuring, Mixing, Transporting, and Placing Concrete", and with the approval of the Engineer.

The Contractor shall furnish and maintain at least two standard 10 foot steel or aluminum straight edges.

Where applicable, the Contractor shall furnish a sufficient number of bridges equipped to ride on the forms and span the pavement for finishing operations and for the installation and finishing of joints and center strips. All necessary finishing and edging tools shall be furnished as may be required to complete the pavement in accordance with the drawings.

360.8

Slip Form Paver. Slip form pavers are allowed by Harris County.

360.9 Subgrade and Forms. The subgrade shall be prepared as required by the applicable subgrade specification items. Rolling and sprinkling shall be performed as necessary, or as directed. The roadbed shall be completed to the elevation as required on the typical sections shown on construction drawings. Drainage of the roadbed shall be maintained at all times.

The subgrade shall be finished to the exact section of the bottom of the pavement as shown on plans. The subgrade shall be maintained in a smooth, compacted condition, in conformity with the required section and established grade until the pavement is placed, and shall be kept thoroughly wetted down sufficiently in advance of placing any pavement to insure its being in a firm and moist condition for at least 2 inches below the prepared surface. No equipment or hauling shall be permitted on the prepared subgrade, except on special permission of the Engineer, which will be granted only in exceptional cases and only where a suitable protection in the form of two-ply timber mats or other approved material is provided.

The subgrade under the forms shall be firm and cut true to grade so that each form section when placed will be firmly in contact for its whole length and base width, and exactly at the established grade. Any subgrade under the forms below established grade shall be corrected, using suitable material, placed, sprinkled and rolled as directed. Forms shall be staked with at least 3 pins for each 10 foot section. A pin shall be placed at each side of every joint. Form sections shall be tightly joined and keyed to prevent relative displacement. Forms shall be cleaned and oiled each time they are used.

Sufficient subgrade shall be prepared far enough in advance of concrete placement to allow a minimum of 300 feet of forms to be set in place in advance of concrete placement at all times (with exception of intersections, etc.) or as approved by the Engineer. Conformity of the grade and alignment of forms shall be checked immediately prior to placing concrete and all necessary corrections made by the Contractor. Where any form has been disturbed or any subgrade has become unstable, the form shall be reset and rechecked. In exceptional cases, the Engineer may require suitable stakes driven to the grade of the bottom of the forms to afford additional support. Sufficient stability of forms to support the equipment operated thereon and to withstand its vibration without springing or settlement shall be required. If forms settle over 1/8 inch under finishing operation, paving operations shall be stopped and the forms shall be reset to line and grade.

Forms shall remain in place for a minimum of 8 hours after the concrete has been placed. They shall be carefully removed so that there is little or no damage done to the edge of the pavement. Any damage resulting

from this operation shall be immediately repaired. After the forms have been removed, the ends of all joints shall be cleaned, and any honeycombed areas pointed up with an approved mortar.

Immediately after pointing is complete, the form trench shall be filled with earth from the shoulders in such manner as to shed water from rainfall or curing away from the edge of the pavement. On completion of the required curing, the subgrade or shoulders adjacent to the pavement shall be placed in condition to maintain drainage.

360.10 Reinforcing Steel and Joint Assemblies. All reinforcing steel, tie bars, load transmission units and splices used in accordance with plan provisions meeting the requirements of Item 440 "Reinforcing Steel", shall be accurately placed and secured in position in accordance with the details shown on drawings.

Reinforcing bars shall be secured at all splices and at alternating intersections. The tie bars shall be installed in required position by the method and device shown on drawings, or by approved method and device equivalent thereto. Bar coatings required by plans, and of material specified, shall be completed and the bars and coating shall be free of rust, dirt or other foreign matter at the time of installation in the concrete. Reinforcing bars shall be supported on bar chairs or other approved devices placed on maximum 36 inches center each way, and placed so that the reinforcing bar is located at the centerline of the concrete.

Where plans require an assembly of parts at pavement joints, the assembly shall be completed, placed at required location and elevation, and all parts rigidly secured in required position as shown on plans, or by approved method and devices equivalent thereto. Dowel bars shall be accurately installed in joint assemblies in accordance with drawings, each parallel to the pavement, and shall be rigidly secured in required position by such means (as shown on plans, or approved equivalent thereto) that will prevent displacement of the dowels during placing and finishing of the concrete. The assembled units comprising the load transmission devices shall be accurately installed in joint assemblies in accordance with plans. Each unit shall be vertical with its length perpendicular to the centerline of the pavement, and all units shall be rigidly secured in required position by such means (as shown on drawings, or approved equivalent thereof) that will prevent displacement of the expansion joint during placing and finishing of the concrete. Joint filler shall be accurately notched to receive each load transmission unit. All load transmission units shall be free of rust and clean when installed in the concrete.

360.11 Concrete Placing. Except by specific written authorization of the Engineer, concrete shall not be placed when the ambient temperature is

below 40°F and falling. Concrete may be placed when the ambient temperature is above 35°F and rising, the ambient temperature being taken in the shade and away from artificial heat.

The Contractor shall have available a sufficient supply of approved cotton mats, polyethylene sheeting or other approved covering materials to immediately protect concrete if the air temperature falls to 32°F, or below, if the concrete has been in place for less than 4 hours. Such protection shall remain in place during the period the temperature continues 32°F or below, or for a period of not more than 5 days. Neither salt nor other chemical admixtures shall be added to the concrete to prevent freezing. The Contractor shall be responsible for the quality and strength of concrete under cold weather conditions and any concrete damaged by freezing shall be removed and replaced at the Contractor's expense.

When the concrete reaches a temperature of 85°F, retarders shall be introduced into the mixture.

If the concrete temperature continues to rise and reaches 95°F, a plasticizer shall be introduced into the mixture. Above 95°F, ice may be used to control temperature, in lieu of a plasticizer.

For concrete between temperatures of 85°F through 95°F, the slump shall be as specified in this Item. For concrete with temperatures between 95-100°F, slumps shall be as specified by the Engineer. The temperature of the concrete shall at no time exceed 100°F. Once concrete has reached a temperature above 100°F, it shall be rejected.

The amount of retarder or plasticizer, introduced into a mixture, shall be in accordance with the manufacturer's recommendations. See Section 360.2, Materials, for requirements of admixtures.

No concrete shall be used if:

- A. the concrete has developed initial set, or
- B. the concrete has not been placed within 1-1/2 hours after the initial water has been added.

Pouring concrete during inclement weather, which would adversely affect the quality and/or finish of the concrete pavement does not relieve the Contractor of his responsibility to provide a pavement that complies with the Item.

360.12 Joints. All transverse and longitudinal joints in the pavement shall be at the locations and of the type shown on the drawings.

Expansion Joints:

Transverse expansion joints shall be formed perpendicular to the centerline and surface of the pavement, and shall be constructed in accordance with the drawings.

The seal space shall be created by either of the following methods:

- A. Seal Space Form (aka Rip Strip) After the transverse finishing machine and before the longitudinal finishing machine has passed over the joint, the Contractor shall test the joint assembly for correctness of position and make any required adjustment in position of the joint assembly. After removal of the seal space form, the seal space above the joint assembly shall be thoroughly cleaned and the concrete faces of the seal space shall be left true to line and section throughout the entire length of the joint.
- B. Other method as approved by the Engineer.

On completion of curing of the pavement, the expansion joint sealant of the type specified shall be placed in accordance with drawings. The faces of the seal space shall be washed and cleaned and surface-dry at the time sealant is placed. On completion of sealing, the pavement surface (adjacent to the joint) shall be left free of sealing material.

Sawcut Joints: - Transverse Contraction and Longitudinal

All contraction joints (transverse or longitudinal) that are not at the edge or end of a pour shall be saw cut. Metal or fiber "rip" strips placed in the uncured concrete will not be permitted. Where sawed joints are required, they shall be sawed as soon as sawing can be accomplished, without damage to the pavement, and as directed by the Engineer. Once sawing has commenced, it shall be continued until completed. The saw cut shall be made with one pass of the concrete saw. Sawing must be accomplished even in rain or cold weather. All sawing must be completed within 24 hours of the concrete pavement placement. Within 24 hours of completing the concrete pour, all sawcut joints shall be sawed and washed of all residue. Should the sawing for any day's placement fail to be completed within 48 hours; the following concrete placement shall be limited to the amount that was sawed on time. The limitation shall continue until the sawing crew demonstrates it can handle a larger volume of sawing.

The sawed cut shall be a minimum of 1/4 inch width and have a depth of one-fourth the thickness of the pavement. After sawcutting, the joint shall

be sealed with joint sealer, in accordance with the instructions supplied by the manufacturer of the joint sealant. Sealant shall fill the joint from bottom to 1/4 inch below concrete surface. Use of backer rods in sawcut joints is prohibited.

Unless otherwise specified, transverse sawed control joints shall be constructed at 20 foot intervals measured along the centerline of the pavement section, or as directed by the Engineer.

Longitudinal Construction Joints:

When constructing a longitudinal construction joint, all applicable provisions of Section 360.7 shall apply in addition to the following requirements:

The face of the bulkhead at the joint shall be grooved or recessed as necessary to provide the required spaces for the top and bottom breaker strips as shown on plans. The bulkhead shall be either drilled or notched to receive the tie bars. Tie bars shall be secured in required position by use of adequate transverse bracing and vertical supports meeting the approval of the Engineer.

360.13 Terminating Concrete Placement:

Normal Terminating Procedures. Concrete placement shall be terminated at an expansion joint or a transverse construction joint that is coincidental with a location of a proposed contraction joint.

When the concrete placement is terminated at an expansion joint or a transverse construction joint, the complete joint assembly shall be installed and rigidly secured in the required position as shown on the plans.

A bulkhead of sufficient cross-sectional area to:

- A. prevent deflection and
- B. accommodate the dowels

shall be provided. The bulkhead shall be shaped accurately to the cross-section of the pavement and installed as a back-up for the expansion joint header or transverse construction joint header and rigidly secured in the required position to permit accurate finishing of the concrete up to the joint.

After the concrete has been finished to the joint, formation of the joint seal space and finishing of the joint shall be executed as specified herein and in accordance with plan requirements. The back-up bulkhead shall remain in place until immediately prior to the time when concrete placement is resumed. It shall then be carefully removed in such manner that no element of the joint assembly will be disturbed. The exposed portions of the joint assembly shall be free of adherent concrete, dirt or other material.

Unscheduled Terminating Procedures. When concrete placement must be terminated at a location other than an expansion joint or transverse construction joint, all applicable provisions of Section 360.7 shall apply, in addition to the following requirements:

A bulkhead shall be installed as a vertical form to pour the concrete against. The bulkhead adjoining the pavement end shall consist of upper and lower panels, with a gap of approximately two inches between, through which the reinforcing steel mat extends. During the concrete pouring process, some concrete will extrude through the gap, which is to be left in place to create a roughly formed "keyway" into the subsequent pour section.

Concrete shall be placed and finished to this bulkhead. Any concrete that falls onto the subgrade ahead of the bulkhead shall be removed and disposed of as directed. The seam created by a construction joint of this type shall have a saw-cut seal space and shall be sealed as required for construction joints.

360.14 Finishing. All finishing shall be in accordance with ACI 325.6R "Texturing Concrete Pavements".

The Engineer shall approve the straightedge. The surface of the concrete shall not vary from the straightedge by more than 1/16 inch per foot from the nearest point of contact, and in no case shall the maximum deviation from a ten foot straightedge to the pavement be greater than 1/8 inch. Any high spots causing a departure from the straightedge in excess of that specified shall be ground down by the Contractor to meet the surface test requirements, when required by the Engineer.

360.15 Curing. The Contractor shall prevent surface drying of the pavement before application of curing system by means that may include water fogging, use of wind screens or the use of evaporation retardants. He shall provide for protection of freshly laid concrete against pitting and washing from rain, by placement of canvas and/or waterproof covering material to protect all placed concrete. The covering material is required to be on the jobsite at the time and place of pouring.

The curing system may be:

- A. Liquid Membrane. Liquid membrane curing shall be used as per Item 526 "Membrane Curing".
- B. Additional Curing Methods. Other methods meeting the requirements of ACI 308R "Standard Practice for Curing Concrete" must be submitted by the Contractor in writing prior to concrete placement and approved by the Engineer.

360.16

Protection of Pavement and Opening to Traffic. The Contractor shall erect and maintain the barricades required by the plans, and such other barricades and approved devices necessary to exclude public traffic and traffic of his employees and agents from the newly placed pavement for the periods of time hereinafter prescribed. Portions of the roadway, or crossings of the roadbed required to be maintained open for use by traffic, shall not be obstructed by the above required barricades. Crossings of the pavement required by plans, or by construction sequence, during the period prior to opening to traffic as herein specified, shall be provided with an adequate and substantial bridge, approved by the Engineer.

Cracked pavement shall be cored by Harris County any time after the 28 day cure time is complete. The location of these cores shall be selected by the Engineer. Pavement that has developed full depth cracks (greater than $t/4$ inch depth, where t = thickness of pavement) may, at the County's option, be left in place and repaired by the epoxy injection method. Otherwise the cracked pavement shall be removed and replaced. There shall be no additional payment for repairs or replacement. Basis of removal for cracked pavement shall be determined by the engineer and the extent of this pavement removal shall be based on the crack pattern and number of cracks in each panel. If the cracks are wide spread (vertically or horizontally) or close to expansion joint or control joint, and over a large area of 12 foot wide panel, then entire panel shall be removed and replaced as determined by the Engineer.

Surface cracks $t/4$ inches and less in depth may be repaired by the epoxy injection method at no cost to the County.

Prior to epoxy injection, the Contractor shall submit to the County for approval, the injection method to be used. The Contractor shall furnish a minimum of 2 year warranty when utilizing the epoxy injection method.

New pavement sections shall be closed to all traffic, both PUBLIC and CONSTRUCTION, until the concrete has attained a compressive strength of 2,700 psi. If the Contractor or the County desires to open the new

pavement section to traffic early, an additional set of test cylinders must be requested for an early test. If the early test indicates that the minimum compressive strength requirement has been met, and if all other requirements of this Item have been met, the pavement section can be opened to traffic. If the Contractor requests the early test, the Contractor will pay the cost. If the County requests the early test, the County will pay the cost. Such opening of a new pavement section, to PUBLIC or CONSTRUCTION traffic, shall in no manner relieve the Contractor from his responsibility of the work.

On those sections of pavement to be opened to PUBLIC traffic, the pavement shall be thoroughly cleaned, stable material shall be placed, graded, and compacted against the pavement edge or curb unless otherwise specified. Joints shall be sealed and cured, and all required traffic control work shall be performed for the safety of the traffic.

The Engineer may require the opening of pavement to traffic prior to the minimum strength specified above under conditions of emergency, which in his opinion, require such action in the interest of the public. In no case shall the Engineer order opening of the pavement to traffic within less than 72 hours after the last concrete in the sections is placed unless an approved high early strength concrete was used. The Contractor shall remove any curing mats, place earth against the pavement edges, and perform other work involved in providing for the safety of traffic as required by the Engineer in ordering emergency opening. Orders for emergency opening of the pavement to traffic will be issued by the Engineer in writing.

360.17 Backfilling Behind Curbs and in Medians and Directional Islands. The Contractor is required to backfill behind all curbs and within medians and directional islands, after completion of the paving operation. The backfill material shall be on-site material having the prior approval of the Engineer. No separate payment shall be made for backfilling behind curbs and in medians and directional islands, but it shall be considered incidental to this Item.

360.18 Deficient Pavement Thickness. It is the intent of this Item that the pavement be constructed in strict conformity with the thickness and typical sections shown on plans.

Concrete Placement Method.

A. Conventional Side Form Paving: The Engineer will check the pavement thickness in accordance with the dimensions shown on the plans. The Engineer will perform 1 thickness test consisting of 1 reading at approximately the center of the paving equipment

every 500 feet or fraction thereof. All deficiencies from plan thickness shall be corrected prior to concrete placement.

- B. Slip Form Paving: The Engineer will check the pavement thickness in accordance with TxDOT's Test Procedure Tex-423-A. The Engineer will perform 1 thickness test consisting of 1 reading at approximately the center of the paving equipment every 500 feet or fraction thereof. Verify deficiencies of more than 0.2 inches from plan thickness and determine the limits of deficiencies of more than 0.75 inches from plan thickness by coring. Core where directed, in accordance with ASTM C174 "Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores." Fill core holes using a concrete mixture and method approved by the Engineer.

Thickness Deficiencies Greater than 0.2 inches. When any depth test measured in accordance with Tex-423-A is deficient by more than 0.2 inches from the plan thickness, take one core at that location to verify the measurement.

If the core is deficient by more than 0.2 inches but less than 0.75 inches from the plan thickness, take 2 additional cores from the unit (500 foot length) at intervals of at least 150 feet and at locations selected by the Engineer, and determine the thickness of the unit for payment purposes by averaging the lengths of the 3 cores. (See Table for "Deficient Pavement Thickness price Adjustment Factor").

Thickness Deficiencies Greater than 0.75 inches. If a core is deficient by more than 0.75 inches, take additional cores at 10 foot intervals in each direction parallel to the centerline to determine the boundary of the deficient area. The Engineer will evaluate any area of pavement found deficient in thickness by more than 0.75 inches. As directed, the Contractor shall remove and replace the deficient areas with concrete pavement of thickness shown on the plans, without additional compensation.

Pavement Units for Payment Adjustment. Limits for applying a payment adjustment for deficient pavement thickness from 0.20 inches to not more than 0.75 inches are 500 feet of pavement in each lane. Lane width will be shown on typical sections and pavement design standards.

For pavement thickness deficiencies greater than 0.75 inches, the limits for requiring removal will be defined by coring as determined by the Engineer. The remaining portion of the unit determined to be less than 0.75 inches deficient will be subject to the payment adjustment based on

the average core thickness at each end of the 10 foot interval investigation as determined by the Engineer.

Shoulders will be measured for thickness unless otherwise shown on the plans. Shoulders 6 feet wide or wider will be considered as lanes. Shoulders less than 6 feet wide will be considered part of the adjacent lane.

Limits for applying payment adjustment for deficient pavement thickness for ramps, widenings, acceleration and deceleration lanes, and other miscellaneous areas are 500 feet in length. Areas less than 500 feet in length will be individually evaluated for payment adjustment based on the plan area.

TABLE FOR DEFICIENT PAVEMENT THICKNESS PRICE
ADJUSTMENT FACTOR

DEFICIENCY IN THICKNESS DETERMINED BY CORES IN INCHES	PROPORTIONAL PART CONTRACT PRICE ALLOWED
0.00 to 0.20	100 Percent
0.21 to 0.30	80 Percent
0.31 to 0.40	72 Percent
0.41 to 0.50	68 Percent
0.51 to 0.75	57 Percent
Over 0.75	Remove and Replace

Any area found deficient in thickness by more than 0.75 inches shall be removed and replaced, at the Contractor's entire expense, with concrete of the thickness shown on drawings.

No additional payment over the contract unit price will be made for any pavements of a thickness exceeding that required on drawings and planing of concrete pavement shall not be allowed.

360.19 Non-Conforming Concrete. Any concrete deemed non-conforming, which in the opinion of the Engineer is unsatisfactory, shall be removed and replaced at the expense of the Contractor.

360.20 Quality Assurance. The Testing Laboratory's representative will sample concrete delivered to the site in accordance with ASTM C172 and will mold four specimens for each 150 cubic yards. Each time a set of specimens is molded, the slump will be determined in accordance with ASTM C143 and the air content in accordance with ASTM C173

“Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method” or ASTM C231 “Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.” Concrete cores, if required, shall be tested in accordance with ASTM C174 (9 point procedure) and ASTM C39.

360.21 Measurement. Concrete pavement shall be measured by the square yard of the specified mix design and thickness of completed and accepted pavement. Dowels, when required, are incidental to this Item, and do not require measurement.

360.22 Payment. The work performed and the materials furnished as prescribed by this Item and measured as provided under "Measurement" shall be paid for at the unit price bid for "Concrete Pavement", or "Concrete Pavement, High Early Strength", as required, or the adjusted unit price for pavement of deficient thickness as provided under "Penalty for Deficient Pavement Thickness", which price shall be full compensation for shaping and fine grading the roadbed, including furnishing and applying all water required; for furnishing, loading and unloading, storing, handling all concrete ingredients, including all freight and royalty involved; for mixing, placing, finishing and curing all concrete; for furnishing all materials for and placing longitudinal, warping, expansion, sawed control and contraction joints, and load transmission units, and joint filler material in proper position; for coating steel bars where required by plans, for furnishing and placing all reinforcing steel, for drilling dowel holes in the existing concrete pavement, providing and installing dowels and epoxy grouting them where required by the plans; and for all manipulations, labor, equipment, appliances, tools, traffic provisions and incidentals necessary to complete the work.

There are line code(s), description(s) and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 205 “Subgrade”
Item 421 “Structural Concrete”
Item 440 “Reinforcing Steel”
Item 526 “Membrane Curing”

END OF ITEM 360

ITEM 361

FULL DEPTH REPAIR OF CONCRETE PAVEMENT

- 361.1 Description. This Item shall govern for repairing deteriorated areas of concrete pavement as herein specified, in conformity with the existing roadway section including curbs as applicable, and as directed by the Engineer.
- 361.2 Materials. The Contractor shall furnish from a source approved by the Engineer, all concrete, and hot poured rubber joint sealing material. Rubber joint sealing material shall conform to ASTM D6690 "Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements."

Concrete for Pavement Repair:

- A. High Early Strength Concrete Mix shall contain 7 sacks of portland cement per cubic yard using a Type I, Type II, or Type III cement, which shall conform to ASTM C150 "Standard Specification for Portland Cement" and in accordance with Item 360 "Concrete Pavement".
- B. Rapid Setting High Early Strength Concrete Mix shall contain 7 sacks of portland cement per cubic yard, with other chemical admixtures and its applications are designed for early opening of the concrete road pavement to traffic 24 hours or less after completing the pour and finish.

An accelerating agent (Type C), conforming to ASTM C494 "Standard Specification for Chemical Admixtures for Concrete" may be used. All chemical admixtures shall be used in accordance with the manufacturer's recommendations.

Proposed concrete curbs may be either monolithically poured with the pavement replacement under this Item, or poured separately, using 5-1/2 sacks of Type I portland cement per cubic yard.

The Contractor shall furnish all reinforcing steel for replacement purposes, when the Engineer deems the existing steel is not salvageable. All reinforcing steel shall meet ASTM A615 "Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement", minimum Grade 60. The rebar size should match the rebar in the existing pavement section unless it violates the following minimum rebar size:

- A. No. 4 rebar for existing concrete pavement that is 7 inches thick or less.
- B. No. 5 rebar for existing concrete pavement 8 inch thick to 10 inch thick.

Reinforcing steel shall be in accordance with Item 440 "Reinforcing Steel".

The Contractor shall furnish all curing compound. Curing compound shall be in accordance with Item 526 "Membrane Curing".

361.3

Construction Methods. When the areas to be repaired are located in an area that is overlaid with asphaltic concrete, the asphaltic concrete shall be removed over an area greater than that to be repaired, as directed by the Engineer.

The minimum dimensions for full depth concrete pavement repair are one lane-width, and not less than 6 feet long. Repair areas smaller than the minimum will show excessive "rocking" against the adjoining concrete pavement sections. Likewise, the minimum remainder of the slab shall be at least 6 feet (to the end of slab or next repair area).

Steel Reinforcement:

Where reinforcement is present, the following procedures shall apply:

- A. A groove approximately 2 inches minimum depth shall be sawed along a line approximately 18 inches beyond the distressed area unless otherwise indicated on the drawings, except along the longitudinal construction joint if it is a pavement repair boundary. The concrete pavement and 6 inches of underlying base shall be removed. The concrete in the area inside the perimeter of the sawcut slab shall be carefully broken and removed leaving a clean vertical face, taking care to work around the reinforcing steel so as not to break the bond in the steel in the adjacent concrete pavement. At the perimeter, the breaking of the existing concrete will be accomplished by only the use of hand tools or lightweight jack hammers as approved by the Engineer. Concrete adjacent to the repair area shall not be spalled or fractured by the removal procedure. Base material shall be removed and replaced with a commercial grade cement stabilized sand base, as per Item 433 "Cement Stabilized Sand Bedding and Backfill Material" Section 433.2 and compacted to provide firm, even support to the concrete pavement.
- B. or as shown in contract documents or approved by the Engineer

Reinforcing bars that are removed shall be replaced with new bars as per the drawings. The protruding reinforcing steel shall be inspected for damage and carefully straightened. New reinforcing bars shall be placed and firmly supported by approved bar chairs.

Longitudinal Reinforcement. The new bars shall be spliced to the existing protruding bars by lapping a minimum of 18 inches or lapping and welding as directed by the Engineer.

If three or more adjacent bars are seriously damaged or broken, they shall be replaced by drilling and grouting 30 inch long reinforcing bars (minimum #5 bars for 7 inch thick concrete; and #6 bars for concrete 9 inches or greater in thickness), using an epoxy adhesive. The 30 inch reinforcing bars shall be embedded a minimum of 10 inches horizontally into the existing concrete pavement at a spacing of 18 inches on center. If less than three adjacent bars are damaged or broken, splicing to broken bars will not be required. The accepted epoxy adhesive shall be in accordance with ASTM C881 "Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete", Type I, II, IV, and/or V; Grade 3; and depending on the air temperature either Class A & B, or Class C.

For all concrete repair work, the following procedures shall apply. The removed concrete and excavated base shall be disposed of by the Contractor, as directed by the Engineer. Replacement of transverse joints will be required where the failed area necessitates the removal of existing joints. Concrete, used for repair, shall be High Early Strength in accordance with Item 360 "Concrete Pavement" or Rapid Setting High Early Strength.

Immediately prior to placing the concrete, the base and each face of existing concrete shall be wetted. Approved hand-operated mechanical vibrators shall be used to insure the proper consolidation of the concrete. The concrete shall be screeded off to the elevation of the adjacent concrete pavement and checked with a straight edge to insure that the riding surface will be satisfactorily repaired. Areas shall also be checked to insure there is adequate slope to provide for free drainage. The concrete shall be finished with a broom finish, as directed by the Engineer. Membrane curing shall be used until the pavement is opened to traffic. Membrane curing shall be in accordance with Item 526 "Membrane Curing".

Part of the concrete repair work adjacent to existing concrete curb shall include replacement of grass sod and any backfill material needed behind the concrete curb, and these repairs shall be incidental to the bid item for concrete pavement repair. The Contractor shall locate any existing

improvements (waterlines, sprinklers, or landscape appurtenances) to mitigate damages. The Contractor shall be responsible for protecting these appurtenances, in the original condition, and if damaged by his operations, the Contractor shall replace them to the original condition or better, at no expense to Harris County.

High Early Strength Concrete:

The repaired area may be opened to traffic after 72 hours, when the concrete has attained a minimum average flexural strength of 500 psi, or a minimum average compressive strength of 2500 psi. All test specimens (tested in accordance with ASTM C78 "Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)" or ASTM C39 "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens") representing tests for opening to traffic, shall be cured using the same methods and under the same conditions as the concrete represented.

Rapid Setting High Early Strength Concrete:

The repaired area may be opened to traffic after 24 hours, when the concrete has attained a minimum average flexural strength of 400 psi, or a minimum average compressive strength of 2600 psi. All test specimens (tested in accordance with ASTM C78 or ASTM C39) representing tests for opening to traffic, shall be cured using the same methods and under the same conditions as the concrete represented.

If the time frame designated for opening traffic is less than 24 hours after concrete placement, concrete must be designed to attain a minimum average flexural strength of 255 psi or a minimum average compressive strength of 1,800 psi within the designated time frame as shown in the contract documents.

361.4

Measurement. Deteriorated areas repaired as prescribed for in this Item shall be measured by the square yard of surface area of the repaired section, regardless of the depth or type of pavement. Calculation for each patch shall be rounded off to the nearest one-hundredth square yard.

All 6 inch reinforced concrete curb shall be measured by the linear foot of curb, as replaced, complete in place, regardless of whether it was poured monolithically with the pavement, or placed separately or whether it was HES concrete or 5-1/2 sack concrete.

Dowelling, when shown on the plans, or required by the Engineer, shall be measured per each dowel placed. Doweling performed at the discretion

of the Contractor shall be incidental to this Item, and does not require measurement.

361.5 Payment. The work performed as prescribed by this Item and measured in accordance with the provisions of Measurement above, will be paid for at the unit price bid for "Full Depth Repair of Concrete Pavement", which price shall be full compensation for:

- A. saw-cutting (full or partial depth as shown on plans or directed by the Engineer);
- B. breaking the existing steel reinforced pavement structure and curb;
- C. excavation of 6 inches of base;
- D. removal, loading, hauling and disposal of the broken concrete pavement, curb and base;
- E. for furnishing and installing all material including reinforcing steel and all joints, including expansion joints;
- F. for all curing;
- G. for placing joint sealant as required;
- H. for cement stabilized sand base;
- I. for the replacement of grass sod with required backfill;

for all manipulations, labor, equipment, appliances, tools and incidentals necessary to complete the work except as follows:

Dowelling performed as Directed by the Engineer Pavement dowelling performed as shown on the plans or as directed by the Engineer shall be measured in accordance with the provisions of Measurement above, will shall be paid for at the unit price bid for "Dowelling", which price shall be full compensation for drilling and grouting, including epoxy adhesive, for furnishing and installing all materials necessary, and for all manipulations, labor, equipment, appliances, tools, and incidentals necessary to complete the work.

The Contractor may choose to use full depth sawcut with drilled-in dowels shown on the typical concrete roadway widening detail drawing. If the Contractor so chooses, the sawcutting and dowels will be at his own expense (these items will only be paid for if the County requires the full depth sawcut and dowels).

Curb Installation:

Proposed concrete curb will be paid for at the unit price bid for 6" reinforced concrete curb, which shall include the removal and disposal of the existing curb as needed. The concrete curb is considered separate from the area measured and paid-for as "Repairing Existing Concrete Pavement".

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires Standard Civil Drawings that shall be incorporated into the contract documents.

NOTE: This Item requires other Standard Specifications

Item 205 "Subgrade"

Item 440 "Reinforcing Steel"

Item 433 "Cement Stabilized Sand Bedding and Backfill Material"

Item 526 "Membrane Curing"

END OF ITEM 361

ITEM 424

EXTENDING CONCRETE STRUCTURES

- 424.1 Description. This Item shall govern for extending existing concrete structures and for the preparation of the existing structures for extending or widening, including the materials used; the removal of portions of the existing structure, preparation of exposed surfaces of steel and concrete for bonding new construction to old; and the construction of the proposed extensions, all as indicated on the plans.
- 424.2 Materials. All materials shall conform to the requirements of Item 421 "Structural Concrete" and Item 440 "Reinforcing Steel".
- 424.3 Construction Methods. The work shall be performed in accordance with the provisions of the Item 420 "Concrete Structures", and in conformance with the requirements as stated and outlined herein. Concrete shall be of the class shown on the plans.

The Contractor shall verify all pertinent dimensions of the existing structure, prior to ordering materials required for the extensions.

Portions of the old structure shall be removed to the lines and dimensions shown on the plans and these materials shall be disposed of as shown on the plans or as directed by the Engineer. Unless noted on the plans, metal railing shall be removed in such a manner that it will not be damaged, stacked neatly on the right-of-way at convenient loading points and will remain the property of Harris County. Any portion of the existing structure, outside of the limits designated for removal, damaged by the operations of the Contractor shall be restored to its original condition at the Contractor's entire expense. Explosives shall not be used in the removal of portions of the existing structure.

When the headwalls, wingwalls and apron are specified on the plans to be reused in the extended structure, the portion to be reused shall be severed from the old structure to the lines and details shown on the plans. The headwall unit shall be moved to the new location specified, by methods approved by the Engineer, and the extension concrete and reinforcement placed according to the plan details. Any portion of the headwall unit damaged by the moving operation shall be restored to its original condition at the expense of the Contractor.

Unless otherwise noted on the plans, a demolition ball or other swinging weight or impact tool, will be permitted on those portions of the structure not immediately adjacent to the break line of the concrete. The concrete

shall be severed at the break line by pneumatic tools, followed by the use of the demolition ball, or other methods acceptable to the Engineer. The final removal of concrete at the break line shall be with pneumatic tools. Damaged concrete shall be treated as specified above. Bridge slabs shall first be sawed along the break line one-half of an inch deep prior to the beginning of the removal of concrete.

Except where otherwise provided on the plans, new reinforcing bars shall be spliced to exposed bars in the old structures by lap splices in accordance with the Item 440 "Reinforcing Steel". When welded splices are permitted, they shall conform to the Item 446 "Structural Welding". For lap splices, not welded, new reinforcing steel need not be tied to existing steel, where spacing and/or elevation does not match that of existing steel, provided the proper lap length is attained.

Dowels, if required by the plans shall be installed by grouting reinforcement bars to a minimum length of 12 inches into the old structure. Holes for dowel bars shall be cleaned of all loose material and wetted and filled with a 1:3 mix grout or other approved material, immediately prior to placing of dowel bars.

Concrete surface which will be in contact with new construction shall be roughened and cleaned prior to placing of forms. These surfaces shall be dampened and coated with mortar just prior to placing fresh concrete. Roadway slabs shall be finished in accordance with the Item 420 "Concrete Structures". Where an overlay is required, the slabs shall be given a reasonably smooth surface finish by longitudinal or transverse screeding, without any straight edge requirements.

The widened portion of bridges and direct traffic culverts shall not be opened to construction traffic until authorized by the Engineer.

424.4 Measurement. The quantities of concrete of the various classifications which will constitute the completed and accepted structure or structures in-place will be measured by the cubic yard, each, square foot, square yard or linear foot as the case may be.

424.5 Payment. The concrete quantities measured as provided above, will be paid for at the unit price bid per "Cubic Yard, per "Each", per "Square Foot", per "Square Yard", or per "Linear Foot", in place, for the various classifications of concrete shown.

The unit price bid for the various classifications shown shall be full compensation for furnishing, hauling and mixing all concrete material; placing, curing and finishing all concrete; all grouting and pointing; furnishing and placing drains, furnishing and placing metal flashing strips;

furnishing and placing expansion joint material required by this Item; removing the designated portion of the existing structure; moving of headwall units for reuse; cleaning, bending and cutting of exposed reinforced steel; welding of new reinforcing steel to old; all grilling and grouting for dowels; cleaning and painting old concrete with neat cement mortar; and for all forms and falsework, labor, new reinforcing tools equipment and incidentals necessary to complete the work.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 420 "Concrete Structures"

Item 421 "Structural Concrete"

Item 440 "Reinforcing Steel"

Item 446 "Structural Welding"

END OF ITEM 424

ITEM 460

REINFORCED CONCRETE PIPE

460.1 Description. This Item shall govern for the furnishing and installing of reinforced concrete pipe.

460.2 Materials. Except as modified herein, materials, manufacture and design of pipe shall conform to ASTM C76 "Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe", Class III, for circular pipe, ASTM C506 "Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe" for arch pipe or ASTM C507 "Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe" for elliptical pipe. All pipe shall be machine made or cast by a process which will provide for uniform placement of the concrete in the form and compaction by mechanical devices which will assure a dense concrete. Concrete shall be mixed in a central batch plant or other approved batching facility from which the quality and uniformity of the concrete can be assured. Transit mixed concrete will not be acceptable for use in precast concrete pipe.

In the manufacture of concrete pipe, the supplier has the option of using portland cement or portland cement plus fly ash, as defined herein. Cement plus fly ash shall be composed of portland cement and 20-30 percent fly ash, by weight. Fly ash shall be Class C or Class F, conforming to the requirements of ASTM C618 "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete."

Joint seal shall be a rubber gasket meeting the requirements of ASTM C443 "Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets." The rubber gasket shall be applied using lubricants of flax soap or equal. Mineral lubricants are not permitted.

Rubber gasket substitution shall not be permitted without written approval from the Design Engineer.

460.3 Submittals. Submit certification from the fabricator that the pipe has been tested and meets the requirements of this Item. The joint material data sheets shall be submitted for approval, by the Design Engineer.

460.4 Installation. Unless otherwise specified, the following method shall govern:

Jointing Rubber Gasket Pipe:

Lay pipe section in trench to true alignment and grade. Exceptional care shall be taken in placing pipe and making field joints. Avoid bumping the pipe in the trench. Place rubber gasket on dry spigot end of pipe. Properly lubricate spigot, with rubber gasket in place, with specified lubricants. Do not twist, roll, cut, crimp or otherwise injure gaskets or force them out of position during closure of joints. Pull or push the pipe home for closure of the joint. Correct joint rebound before backfilling the pipe. Remove foreign matter or dirt from pipe and keep clean during and after laying.

Install reinforced concrete pipe in accordance with Item 430 "Construction of Underground Utilities", and all related drawings/plans.

Unless otherwise shown on the plans, not more than two holes may be placed in the top section of the pipe for lifting and placing. The holes may be cast, cut, or drilled in the wall of the pipe. The holes shall not exceed 3 inches in diameter at the inside surface of the pipe wall. Not more than one longitudinal wire or two circumferential wires may be cut per layer of reinforcing steel when locating lift holes in the pipe wall.

All lifting holes shall be sealed to the satisfaction of the Engineer. Tapered lifting plugs shall be used, and sealed externally and internally with an acceptable cement grout. Additionally, lifting plugs shall not protrude from the pipe greater than one-half of an inch.

460.5 Quality Assurance. Concrete pipe 54 inches and smaller in diameter shall be tested in accordance with ASTM C497 "Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile" using the method outlined by Part 4. "External Load Crushing Strength Test by the Three-Edge Bearing Method". The pipe shall be tested at a frequency of three pipe joints for each 100 joints cast, for each pipe size.

Concrete pipe 60 inches and larger shall also be tested in accordance with ASTM C497 using the method outlined by Part 6. "Core Strength Test". However, where the manufacture of the pipe is witnessed by the Engineer, tests using concrete cylinders in accordance with ASTM C39 "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens", shall be acceptable. All test specimens and testing shall be done by the producer of the concrete pipe.

Pipe previously approved and stamped by a Texas Department of Transportation (TxDOT) approved fabricator with specific stamp, which must state: "Certifies Specification Compliance" (i.e. compliance with TxDOT's DMS - 7310 "Reinforced Concrete Pipe and Machine-Made Precast Concrete Box Culvert Fabrication and Plant Qualification" requirements) will be accepted by all laboratories and by Harris County.

For pipes that are stamped by the fabricator as stated above, copies of test results (D-loads and compressive strengths) shall be submitted to the Engineer.

Random Inspection and Testing. Harris County reserves the right to inspect, sample, and test reinforced concrete pipe at any time to ensure compliance with this Item. The pipe manufacturing plant shall provide facilities, equipment, and access to allow for inspection regarding: the quality of materials, the process for manufacturing, and the finished pipe at the plant; in addition to the inspection that is done of the finished pipe at the site before and during the installation.

460.6 Acceptance Requirements. Variations in diameter, size, shape, wall thickness, reinforcement placing, laying length, and permissible underrun of length shall be in accordance with the applicable ASTM Standard for each type of pipe as referred in Section 460.2.

Pipe shall be free from fractures, all cracks and surface roughness. The ends of the pipe shall be normal to the walls and centerline of the pipe. Pipe shall be cured in accordance with the applicable ASTM Standard for each type of pipe as referred to herein.

The following information shall be clearly marked on each section of pipe:

- A. The class and ASTM or D-Load of pipe.
- B. The date of manufacture.
- C. The name or trademark of the manufacturer and plant location.
- D. Designated manufacturer's certifying stamp.
- E. One end of each elliptical section of pipe shall be clearly marked on the inside and outside to show the location of the top and bottom of pipe.
- F. Clearly mark pipe to be used for jacking and boring (when applicable).
- G. Pipe meeting sulfate-resistant concrete plan requirements (when applicable).

Marking shall be indented on the pipe section or painted thereon with waterproof paint.

Pipe shall be subject to rejection for failure to conform to any of the specification requirements. Individual sections of the pipe may be rejected because of any of the following:

- A. Fractures or cracks passing through the shell/wall of pipe with exception of a single crack that does not exceed the depth of the joint.
- B. Defects that indicate imperfect proportioning, mixing and molding.
- C. Surface defects indicating honeycombed or open texture.
- D. Damaged ends, when such damage would prevent making a satisfactory joint.
- E. Any continuous crack having a surface width of 0.01 inch or more and extending for a length of 12 inches or more.

The painting of pipe shall not be allowed prior to delivery on the project.

460.7

Measurement & Payment. Gravity pipelines (R.C.P.) shall be measured by the linear foot of pipe actually laid, at finished grade, along pipe of size and at depth installed, in accordance with Item 430 "Construction of Underground Utilities". Measure depth at manholes, at intervals not to exceed 50 feet between manholes, and at breaks in profile of natural ground from flow line of pipe to natural ground surface over center of pipe. Payment for gravity pipeline, furnished, installed and measured as stated shall be at the contract unit price bid for the size, type, (and depth, if shown on the proposal) measured under their respective bid line codes.

If the depth of cut is not shown on the proposal, no consideration shall be made for depth at which the pipe is installed.

Pipe installed by tunneling shall be paid for in accordance with Item 431 "Jacking, Boring and Tunneling Pipe" or Item 432 "Tunnel Construction".

No separate payment shall be made for ordinary bedding and select backfill, unless so indicated on the bid form.

No separate payment shall be made for hauling and storing suitable excavated trench material for other uses or for disposal of excess or unsuitable materials.

No separate payment shall be made for any bedding and backfill installed in accordance with these Standard Specifications and the drawings.

Well Pointing shall be measured and paid for in accordance with the Item 436 "Well Pointing."

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 430 "Construction of Underground Utilities"

Item 431 "Jacking, Boring or Tunneling Pipe"

Item 432 "Tunnel Construction"

Item 436 "Well Pointing"

END OF ITEM 460

ITEM 472

INLETS

472.1 Description. This Item shall govern for furnishing and installing inlets of the type designated on the plans including but not limited to all frames, plates, grates and covers.

472.2 Materials. Reinforcing steel shall conform to the Item 440 "Reinforcing Steel". Concrete shall conform to the Item 421 "Structural Concrete". Precast concrete inlets shall be manufactured in accordance with the Item 420 "Concrete Structures".

Cement mortar shall conform to ASTM C270 "Standard Specification for Mortar for Unit Masonry", Type M. Aggregate for mortar shall conform to ASTM C144 "Standard Specification for Aggregate for Masonry Mortar."

Cast iron for frames, plates, covers, I-beams and grates shall be in accordance with ASTM A48 "Standard Specification for Gray Iron Castings", Class 30 and shall be free from sand, blow holes or other defects. Frames, plates, grates and covers shall have machined bearing surfaces and conform to the Standard Civil Drawings.

472.3 Construction. All sections of the inlets will be constructed of reinforced concrete.

Prior to setting and/or casting of the inlet, the Contractor shall provide a base/bedding of 6 inch thick cement stabilized sand.

After construction/installation of the inlet, backfill with a minimum thickness of 12 inches of cement stabilized sand that completely circumvents the outside wall of the inlet, up to the elevation of the pavement. Then complete the backfill of the excavated hole, with material that's in accordance with Item 430 "Construction of Underground Utilities".

Inlets that are constructed/installed adjacent to and flush to the elevation of concrete pavement shall be constructed with a minimum 3/4 inch expansion joint material, that is in accordance with Item 360 "Concrete Pavement".

Use non-shrink grout (applied per manufacturers recommendation) to attain a water tight seal at the wall opening of the inlet with the pipe.

For box culvert and arch pipe (all non-circular applications) connections, use non-shrink grout to ensure a water tight seal.

Neatly cut off inlet leads at inside face of inlet wall and point up with mortar. Shape floor with mortar as shown on the applicable Standard Civil Drawings for inlets.

472.4 Measurement. Measure depth of inlets as the vertical distance from the flow line of inlet lead to the top of curb or top of grate.

For inlets constructed with 24 inch leads, the standard depth is 6 feet deep.

Any portion of the inlet exceeding the above depth is to be measured per vertical foot of depth.

472.5 Payment.

A. Payment for Standard Type Inlets.

Payment for inlets with a standard depth shall be made at the contract unit price for each individual standard type inlet (includes non-shrink grout, cement stabilized sand backfill, & expansion joint material).

B. Payment for Inlets with an Additional Depth Greater Than 6 Feet.

When the depth of the inlet specified is greater than the standard depth by more than 6 feet, payment shall be at the contract unit price for each individual inlet (includes non-shrink grout, cement stabilized sand backfill, & expansion joint material) as follows:

“Type B Inlet with an Additional Depth Greater than 6 Feet”

“Type B-B Inlet with an Additional Depth Greater than 6 Feet”

“Type C Inlet with an Additional Depth Greater than 6 Feet”

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires Standard Civil Drawings that shall be incorporated into the contract documents.

NOTE: This Item requires other Standard Specifications.

Item 360 “Concrete Pavement”

Item 420 “Concrete Structures”

Item 421 “Structural Concrete”

Item 430 “Construction of Underground Utilities”

Item 440 “Reinforcing Steel”

END OF ITEM 472

ITEM 493

RIPRAP

493.1 Description. This Item shall govern for furnishing and installing of concrete or stone riprap for common erosion protection applications in open channels.

493.2 Materials. The storage area shall be kept clean, firm, and smooth and well drained in order that the riprap can be recovered free from dirt and other foreign matter.

The riprap shall be stockpiled and handled so as not to cause undue segregation of particle sizes either in the stockpile, or while loading, hauling and handling.

The riprap shall consist of broken concrete or stone blocks and shall be dense, durable and hard material free from cracks, seams and other defects which would tend to increase deterioration from handling and natural causes.

Where broken concrete is used, all exposed metal, including rebar and wire mesh, shall be cut off flush with the surface of the block prior to placing.

Spalls, fragments and chips shall not exceed 5 percent by weight. The dimension and shape limitations do not apply to this portion of the riprap.

Riprap blocks shall be provided in cubic form, rather than elongated (flat) shapes.

The minimum thickness of each block shall be 6 inches.

No more than 25 percent of the blocks may have a length greater than 2-1/2 times the width or thickness. No length of block shall exceed 3 times the width or thickness.

The riprap shall be well graded and shall conform to the following tables unless specifically noted otherwise on the drawings:

TABLE 1 - RIPRAP GRADATION NO. 1

PERCENT LIGHTER BY WEIGHT	STONE WEIGHT (Lbs.)		VOLUME CUBIC FOOT (2)		CUBICAL SHAPE (Ea. Side, ft.)		SPHERICAL SHAPE (Dia., ft.)	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit
100	180	265	1.20	1.77	1.06	1.21	1.31	1.50
50	80	110	0.53	0.73	0.81	0.90	1.01	1.12
15	40	60	0.27	0.40	0.64	0.74	0.80	0.91

NOTES: The theoretical cube and sphere size is presented in the table for guidance only. The previous size and shape specifications shall govern.

Volume is based on 150 pcf, unit weight.

This gradation is to be used in normal applications, and may be noted on the drawings as standard riprap, riprap, 18 inch thick riprap mats, or other similar designations.

TABLE 2 - RIPRAP GRADATION NO. 2

PERCENT LIGHTER BY WEIGHT	STONE WEIGHT (Lbs.)		VOLUME CUBIC FOOT (2)		CUBICAL SHAPE (Ea. Side, ft.)		SPHERICAL SHAPE (Dia., ft.)	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit
100	260	640	1.73	4.27	1.20	1.62	1.49	2.01
50	130	200	0.87	1.33	0.95	1.10	1.18	1.37
15	40	150	0.27	1.00	0.64	1.00	0.80	1.24

NOTES: Provide a 24 inch thick mat, minimum, for Riprap Gradation No. 2.

The theoretical cube and sphere size is presented in the table for guidance only. The previous size and shape specifications shall govern.

Volume is based on 150 pcf, unit weight.

The gradation is to be used only where specifically noted on the drawings as "Riprap Gradation No. 2".

For special applications, gradation, thickness, and other special requirements shall be as shown in the plans.

493.3 Construction Methods. The riprap shall meet the gradation and quality requirements prior to placing.

The riprap shall be placed to the slopes, lines, and grades as shown on the drawings, to provide a well-graded mass of riprap without voids.

Thickness of the riprap mat shall be as shown on the drawings, with a minimum mat thickness as shown on the gradation tables.

The riprap shall be placed in one course (lift) across the channel bottom, then up the channel side slopes. Place the riprap carefully in such a manner to avoid displacement or damage to the prepared surface or geotextile and in such a manner to avoid segregation of particle sizes. Place riprap as close to final position as feasible.

The riprap blocks are to be in close contact, well-graded, and free from pockets of small stones or clusters of large stones. Elongated riprap blocks shall be well distributed throughout the riprap mat. Individual oversized blocks will not be permitted. These shall be broken to acceptable size or removed and replaced with riprap within the gradation limits. Surface irregularities shall be minimal.

Do not drop riprap from such a height to cause breakage or to damage the geotextile (if used).

Prevent mixture or incorporation of dirt or other materials with the riprap during placing operation.

Placing of riprap by any method, machine or hand, will be permitted as long as specified requirements are obtained.

Fill spaces between larger riprap blocks with spalls and smaller blocks of the largest feasible size to form a compact mass. Do not place spalls and small blocks in place of larger size blocks.

493.4 Measurement. Riprap shall be measured by the square yard or by the ton of riprap material, as noted on the bid sheets. Riprap Gradation No. 1 when measured by the square yard shall be for a minimum specified thickness of 18 inches, complete in place. Riprap Gradation No. 2 when

measured by the square yard shall be for a minimum specified thickness of 24 inches, complete in place.

Channel excavation to the top of riprap (finish grade) is measured as shown on the bid sheets.

Excavation for the placement of Riprap Gradation No. 1 to 18 inches beyond the finish grade shall be considered incidental to placement of riprap.

Excavation for the placement of Riprap Gradation No. 2 to 24 inches beyond the finish grade shall be considered incidental to placement of riprap.

Channel fill to the top of riprap (finish grade) is measured as shown on the Bid Sheets. Channel fill, not approved by the Engineer, shall not be measured.

Geotextile under the riprap, where required (as shown on the drawings), shall not be measured and shall be considered incidental to riprap.

493.5 Payment. Payment for riprap shall be based on the unit price per square yard or the price per ton for riprap placed, as shown on the plans. Payment shall be full compensation for providing all labor, materials, geotextile, excavation and equipment necessary to complete the riprap installation.

Excavation for the placement of riprap is considered incidental.

Payment for Channel Excavation to the top of riprap (finish grade) is paid for as shown on the Bid Sheets.

Fill, as approved by the Engineer, to the top of riprap (finish grade) is paid for as shown on the Bid Sheets.

There are line code(s), description(s) and unit(s) for this Item.

NOTE: This Item requires other Standard Specification

Item 494 "Geotextiles"

END OF ITEM 493

ITEM 495

REMOVING OLD STRUCTURES

495.1 Description. This Item shall govern for the removal and disposal of old structures or portions of structures such as bridges, headwalls, box culverts, pipes, timber structures, and other structures, as noted on the plans. This Item shall include all excavation and backfill necessary to complete the removal.

495.2 Method of Removal. Culvert or sewer pipe for reuse shall be removed by careful excavation of all material on the top and sides so that the pipe will not be damaged. Removal of sewer appurtenances shall be included for removal with the pipe. Those pipe which are deemed unsatisfactory for reuse, by the Engineer, will be removed and disposed of, off the job site, in any manner the Contractor may select.

When an existing concrete structure is to remain in use, the removal of any portions thereof shall be in accordance with the Item 424 "Extending Concrete Structures".

Concrete portions of structures below the permanent groundline shall be neatly squared off. Reinforcement shall be cut off close to the concrete.

Steel structures or steel portions of structures shall be dismantled in sections determined by the Engineer. The sections shall be of such weight and dimensions which permit convenient handling, hauling and storing. Rivets and bolts connecting steel rail members, steel beams or girder spans and steel stringers of truss spans will be removed by cutting the heads with a cold cut then punched or drilled by a method that will not injure the member for reuse and will meet the approval of the Engineer. The removal of rivets and bolts, from connections, will not be required unless specifically called for. Unless otherwise specified, the Contractor shall have the option of dismantling these members by flame cutting immediately adjacent to the connection. Flame-cutting will not be permitted when plans call for the structural unit to be salvaged in such a manner as to permit re-erection. In such case, all members shall be carefully dismantled without damage and match marked with paint in accordance with the plans and all rivets and belts shall be removed from the connections in the manner specified in this section.

Timber structures or timber portions of structures to be reused shall be removed with as little damage to the timber as possible. All bolts and nails shall be removed from such lumber as deemed salvageable by the Engineer.

Unless otherwise specified on the plans, timber piles shall be either pulled or cut off at a point not less than two feet below the groundline, or to final grade, with the choice between these two methods resting with the Engineer.

Brick or stone structures shall be removed by sledging the masonry into removal sizes. Portions of such structures below the permanent groundline, which will not in any manner interfere with the proposed construction, may be left in place, but removal shall be carried at least two feet below the permanent groundline and neatly squared off.

All material such as pipe, timbers, railing, etc. which the Engineer deems as salvageable for reuse and all structural steel shall be carefully placed in neat piles along the right-of-way at convenient loading points. All of these materials shall be the property of Harris County.

All timber structural members which are deemed unsatisfactory for reuse, by the Engineer, will be removed and properly disposed of at a permitted landfill. If the timber is treated wood, such as creosote, then the timber shall be disposed of as a hazardous waste, and a copy of the waste manifest shall be provided to the Engineer. The transportation and disposal cost for unsalvageable timber structural members shall be the responsibility of the Contractor. If temporarily stored on site until final disposition, all reusable timber members and waste timber members shall be blocked up off the ground and covered with a tarp.

The I-beams, girders, stringers, etc. which are to be put in storage or specified for reuse, shall be blocked up off the ground to protect the members against damage.

Materials which are not deemed salvageable by the Engineer, shall become the property of the Contractor and shall be removed and disposed of off the site by the Contractor. The Contractor is responsible for the proper protection of all materials that are salvageable.

All excavation made in connection with this Item and all openings below the natural groundline caused by the removal of old structures or portions thereof shall be back filled to the level of the original groundline, unless otherwise provided on the plans. No separate payment shall be made for backfill and it shall be considered subsidiary to this Item.

That portion of the backfill which will support any portion of the roadbed or embankment shall be placed in layers of the same thickness as those required for placing embankment. Material in each layer shall be wetted uniformly, if required, and shall be compacted to the density required in the adjoining embankment. In places inaccessible to blading and rolling

equipment, mechanical or hand tampers shall be used to obtain the required compaction.

That portion of the backfill which will not support any portion of the roadbed or embankment shall be placed as directed by the Engineer in such manner and to such state of compaction as will preclude objectionable amounts of settling.

495.3 Measurement. The work as provided for by this Item shall be measured as each individual structure to be removed, except that box culverts, pipes and water lines shall be measured by the linear foot. The removal shall include all appurtenances thereto.

495.4 Payment. The work as prescribed for in this Item shall be paid for at the unit price bid for "Removing Old Structures" per each or "Removing Old Box Culverts, Pipes or Water Lines" per linear foot, which price shall be full compensation for all work, labor, tools, equipment, excavation, backfilling, materials, disposal costs and incidentals necessary to complete the work.

There are line code(s), description(s) and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 424 "Extending Concrete Structures"

END OF ITEM 495

ITEM 530

CONCRETE CURB, CONCRETE CURB & GUTTER,
SIDEWALKS AND DRIVEWAYS

- 530.1 Description. This Item shall govern for curb, monolithic curb and gutter, sidewalks and/or driveways, with or without reinforcing steel, composed of portland cement concrete constructed on approved subgrade, foundation material, or finished surface in accordance with the lines and grades established by the Engineer and in conformance with the details shown on the plans. ADA compliance is required for sidewalks and ramps.
- As used in this Item the word "curb" refers to standard 6 inch, doweled, and mountable concrete curbs, and monolithic curb and gutter.
- 530.2 Materials. Concrete used in conventionally formed construction shall be minimum Class D2 concrete, meeting the requirements of Item 421 "Structural Concrete". Concrete for extruded construction shall also be minimum Class D2.
- Cement mortar shall conform to ASTM C270 "Standard Specification for Mortar for Unit Masonry", Type M. Aggregate for mortar shall conform to ASTM C144 "Standard Specification for Aggregate for Masonry Mortar."
- In construction of concrete curb, concrete curb and gutter, sidewalks and driveways, the Contractor has the option of using portland cement or portland cement plus fly ash, as defined herein. Cement plus fly ash shall be composed of portland cement and 20-30 percent fly ash, by weight. Fly ash shall be Class C or Class F, conforming to the requirements of ASTM C618 "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete."
- Reinforcing steel shall conform to the requirements of Item 440 "Reinforcing Steel".
- Membrane curing materials shall meet the requirements of the Item 526 "Membrane Curing".
- Bank sand, used as bedding material for concrete sidewalks, shall meet the requirements of Item 402 "Bank Sand Backfill".
- 530.3 Construction Methods. Any required excavation and backfill shall be completed in accordance with Item 400 "Structural Excavation and Backfill", except for measurement and payment, and/or in accordance with Item 110 "Roadway Excavation" and Item 132 "Embankment".

For conventionally formed concrete, the subgrade, foundation, or pavement surface shall be shaped to the line, grade and cross-section and if considered necessary by the Engineer, hand tamped and sprinkled. If dry, the subgrade or foundation material shall be sprinkled lightly immediately before concrete is deposited thereon.

Outside forms shall be of wood or metal, of a section satisfactory to the Engineer, straight, free of warp and of a depth equal to the depth required. They shall be securely staked to line and grade, and maintained in a true position during the depositing of concrete. Inside forms for curbs shall be of approved material, shall be of such design as to provide the curb required and shall be rigidly attached to the outside forms.

The reinforcing steel and/or dowels, if required, shall be placed in the position shown by the plans. Care shall be exercised to keep all steel in its proper location.

After the concrete has been struck off and after it has become sufficiently set, the exposed surfaces shall be thoroughly worked with a wooden float. The exposed edges shall be rounded by the use of an edging tool to the radius indicated on the plans. Unless otherwise specified on the plans, when the concrete has become sufficiently set, the inside form for curbs shall be carefully removed and the surface shall be plastered with a mortar consisting of one part of portland cement and two parts of fine aggregate. The mortar shall be applied with a template made to conform to the dimensions as shown on the plans. All exposed surfaces shall be brushed to a smooth and uniform surface.

Sidewalks shall be constructed in sections of the lengths shown on the plans. Unless otherwise provided by the plans, no section shall be of a length less than 8 feet and any section less than 8 feet shall be removed by the Contractor at his own expense. The different sections shall be separated by a premolded or board joint of the thickness shown on the plans, placed vertically and at right angles to the longitudinal axis of the sidewalk. Where the sidewalks or driveways abut a curb or retaining wall, approved expansion material shall be placed along their entire length. Similar expansion material shall be placed around all obstructions protruding through sidewalks or driveways. Sidewalks shall be marked into separate sections, each 4 feet in length, by the use of approved jointing tools. The reinforced concrete sidewalk shall be placed on a bedding material of bank sand, at a minimum of 2" thick.

Curbs, gutters and curb and gutters shall be placed in sections of 80 foot maximum length unless otherwise shown on the plans. Joints shall be

constructed at such locations and of the type as directed and specified on the plans.

All concrete placed under this Item shall contain 4 percent \pm 1-1/2 percent entrained air. The completed work shall be cured for a period of not less than 72 hours in accordance with the requirements of the Item 526 "Membrane Curing". Color of concrete shall be in accordance with Item 531 "Coloring Concrete for ADA Ramps".

Extruded Concrete Curbs:

For extruded concrete construction, the concrete shall be placed by an extrusion machine approved by the Engineer. When placement is directly on subgrade or foundation materials the foundation shall be hand-tamped and sprinkled if considered necessary by the Engineer. If the concrete is placed directly on the surface material or pavement, such surface shall be thoroughly cleaned. If required by plan details, the cleaned surface shall then be coated with an approved or other coating as specified at the rate of application per vendor recommendations.

The horizontal alignment shall be maintained from a "guide" line set by the Contractor. The alignment shall strictly conform to the details shown on the plans. The forming tube of the extrusion machine shall be readily adjustable vertically, during the forward motion of the machine to provide variable heights necessary to conform to the established grade line. To provide a continuous check on the grade, a pointer or gauge shall be attached to the machine in such a manner that a comparison can be made between the extruded work and the grade line. Other methods may be used if approved by the Engineer.

The mix shall be fed into the machine in such a manner and at such consistency that the finished work will present a well compacted mass with a surface free from voids and honeycomb and true to the established shape, line and grade.

Any additional surface finishing specified and/or required, shall be performed immediately after extrusion. Joints shall be constructed at such location as directed by the Engineer and to the details shown on the plans.

All concrete placed under this item shall contain 4 percent \pm 1-1/2 percent entrained air. The completed work shall be cured for a period of not less than 72 hours in accordance with the requirements of the Item 526, "Membrane Curing".

530.4 Measurement. Work and accepted material as prescribed by this Item for concrete curb, will be measured by the linear foot, complete in place.

Work and accepted material as prescribed by this Item for concrete sidewalks shall be measured by the square yard of surface area, complete in place including bank sand bedding material, as indicated on the plans.

Work and accepted material as prescribed by this Item for ADA curb ramps shall be measured by units of each, or square yard of surface area at specified depth, complete in place. When required, the Contractor's coordination of a TDLR inspection shall be an integral part of each ADA compliant sidewalk construction site.

Work and accepted material as prescribed by this Item for concrete driveways, shall be measured by the square yard of surface area, at specified depth complete in place.

530.5 Payment. The work performed and the materials furnished as prescribed by this Item and measured as provided under measurement will be paid for at the unit price bid for:

- A. "Concrete Curb" of the type indicated on the plans
- B. "Concrete Sidewalks" of the width, and type indicated on the plans.
- C. "ADA Curb Ramps"
- D. "Concrete Driveways"

The price for each item shall be full compensation for:

- A. Cleaning and coating the base
- B. Furnishing and applying all water, mortar, adhesives or other material, including reinforcing steel and dowel bars, if required
- C. For furnishing, loading and unloading, storing, hauling and handling all ingredients, including all freight and royalty involved
- D. For mixing, placing, finishing, sawing, cleaning and sealing joints and curing all concrete
- E. For furnishing all materials for sealing joints and placing joints and joint filler material in proper position
- F. For all manipulations, labor, equipment, appliances, tools, traffic provisions and incidentals necessary to complete the work.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires Standard Civil Drawings that shall be incorporated into the contract documents.

NOTE: This Item requires other Standard Specifications.

Item 110 "Roadway Excavation"
Item 132 "Embankment"
Item 360 "Concrete Pavement"
Item 400 "Structural Excavation and Backfill"
Item 402 "Bank Sand Backfill"
Item 440 "Reinforcing Steel"
Item 526 "Membrane Curing"
Item 531 "Coloring Concrete for ADA Ramps"

END OF ITEM 530

ITEM 531

COLORING CONCRETE FOR ADA RAMPS

- 531.1 Description. This Item shall govern for the coloring of concrete ADA ramps in accordance with the details shown on the plans and the requirements of these Standard Specifications.
- 531.2 Materials. All materials shall conform to the requirements of Item 530 “Concrete Curb, Concrete Curb and Gutter, Sidewalks and Driveways” with the following exceptions:
- A. Color Hardener. Bomanite or Lithochrome color hardeners, or approved equal is to be used. The color shall be as shown on the plans.
 - B. Colored Wax. Color wax complying with ASTM C309 “Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete” as a curing membrane and with all applicable air pollution regulations is to be used.
- 531.3 Construction Methods. After the concrete mix is placed and finished in accordance with Item 530 “Concrete Curb, Concrete Curb and Gutter, Sidewalks and Driveways”:
- A. The colored hardener shall be applied evenly to the plastic surface by the dry-shake method using a minimum of 65 pounds per 12 square yards. It shall be applied in two separate applications, wood floated after each application and troweled only after the final floating.
 - B. While the concrete is still in the plastic stage of set, using forming tools approved by the Engineer, the concrete shall be patterned to create the surface as shown on the plans and as approved by the Engineer.
 - C. The colored curing and finishing compound shall be applied in accordance with the manufacturers’ recommendations.
- 531.4 Measurement and Payment. This Item shall not be paid for directly, but shall be considered incidental to Item 530 “Concrete Curb, Concrete Curb and Gutter, Sidewalks and Driveways”.

There are no line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications.

Item 530 “Concrete Curb, Concrete Curb and Gutter, Sidewalks and Driveways”

END OF ITEM 531

ITEM 550

EXISTING FENCING AND GATES

550.1 Description. This Item shall govern for the removal of existing fencing and gates and their disposal, salvaging or reinstallation at a location as shown on the drawings or directed by the Engineer.

550.2 Construction Methods. Fencing which is designated to be removed but not reinstalled shall be removed from the site and disposed of by the Contractor in compliance with current local, State and Federal Regulations unless salvaged as directed by the Engineer. All holes left as a result of post removal, if in an area not to receive roadway construction, excavation or fill, shall be filled and tamped with dirt to the elevation of natural ground. The Contractor shall provide the dirt.

At such locations where new fencing is to be installed and existing fencing removed, the existing fence shall not be removed until after new fencing has been installed.

When a chain link fence is to be reinstalled it shall be installed in accordance with the Item 555 "Chain Link Fencing". When barbed wire fence is to be reinstalled, it shall be installed in accordance with the Item 556 "Four Strand Barbed Wire Fence". When wood fencing is to be reinstalled, it shall be installed in accordance with the Item 554 "Wood Fencing". When an existing fence is to be reinstalled, it shall be installed with the same material, post spacing as the original, and design, or as otherwise directed by the Engineer.

If a chain link fence is to be reinstalled, the reinstallation of pig rings and wire clips shall be accomplished with new galvanized or aluminum rings and clips.

All new gates shall be as shown on the plans, or as directed by the Engineer. New gates shall be paid for under Items 554, 555 and 556, as appropriate.

550.3 Measurement. Measurement for the:

- A. Removal and Disposal
- B. Removal and Salvage
- C. Removal and Reinstallation

of existing fencing shall be made by the linear foot, including gates.

550.4 Payment. Payment shall be made at the contract unit price bid per linear foot by type of fencing, including gates:

- A. To be removed and disposed of;
- B. To be removed and salvaged;
- C. To be removed and reinstalled;

and this unit price shall include furnishing and installing, all labor, equipment, and any new materials necessary for; removal and disposal, removal and salvaging and/or reinstallation, necessary to complete the work.

There are line code(s), description(s) and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications.

Item 554 "Wood Fencing"

Item 555 "Chain Link Fencing"

Item 556 "Four Strand Barbed Wire Fence"

END OF ITEM 550

ITEM 556

FOUR STRAND BARBED WIRE FENCE

556.1 Description. This Item shall govern for furnishing and installing the materials for one line of 48 inch, four strand barbed wire fence in accordance with the details and at the locations shown on the plans.

556.2 Materials. Barbed wire shall be fine coated (galvanized) steel, meeting the requirements of ASTM A121 "Standard Specification for Metallic-Coated Carbon Steel Barbed Wire", 2 twisted strands of 12-1/2 gauge wire with 2-point 14 gauge barbs at 5 inch maximum spacing. Zinc coating shall be to Class 1 requirements.

Staples shall be new 9 gauge galvanized hard wire. All staples shall be a minimum of 1-1/2 inches long. Staples shall be driven diagonally with the wood grain to avoid splitting. Space should be left between the staple and the post, to permit movement of wire.

Treated wood posts and braces shall be pine, or fir timber, meeting the requirements of AWPA Standard U1, suitable for Use Category 4A. Line posts shall have a maximum spacing of 12 feet and have 3 inch to 4 inch tops. Line posts shall be a minimum of 6 feet long and shall be set 24 inches in the ground.

All corner, pull and gate posts shall be 7 feet long and a minimum of 6 inches round and be set in the ground 36 inches.

The timber shall be sound and free from all decay, shakes, splits or any other defects which would weaken the posts or braces or otherwise make them structurally unsuitable for the purposes intended.

All posts and braces shall be round. A line drawn from the center of each end of the post shall not fall outside the center of the post at any point more than 2 inches. All posts and braces shall be penta-treated and shall have pentachlorophenol wood treatment of a minimum of 8 pounds per cubic foot of 5 percent penta solution.

Posts shall be inspected at time of treatment. Round posts and braces shall be peeled to remove all outer bark and all inner cambium bark, except that occasional strips of bark may remain if not over 1/2 inch wide or over 3 inches long. All knots shall be trimmed flush with the sides, spurs and splinters removed. The allowable taper from end to end of round posts and braces shall not exceed 1-1/2 inches.

Contractor shall provide and install gates at the locations shown on the plans. Gates shall be 14' wide, and the same dimension as the height of the fence, Hog Gate by Farmaster or approved equal, installed as per manufacturer's recommendations.

- 556.3 Construction Methods. Fence posts shall be spaced at the intervals required by this Item. All posts shall be set in a vertical position. Corner and pull posts shall be braced in two directions. End and gate posts shall be braced in one direction. Where alignment changes 15 degrees or more, a corner post shall be installed. The spacing of pull post assemblies shall be approximately 500 feet, unless otherwise shown on the plans. All posts shall be placed the minimum depth below ground as shown on the Standard Civil Drawings or as required by these Standard Specifications. Posts shall be set plumb and firm to the lines and grades shown on the plans. Backfilling shall be thoroughly tamped in 4 inch layers. The timber post braces shall be notched as shown on the plans.

The corner, end or angle post assembly shall be installed before stretching the barbed wire between line posts. The barbed wire shall be installed inside (cattle side) of the posts. At all grade depressions where stresses tend to pull the posts out of the ground, the fencing shall be snubbed or guyed at the critical points by means of a twisted double loop of 9 gauge galvanized wire connected to each horizontal line of barbed wire and then to a deadman, or screw type anchor, buried in the ground as shown on the Standard Civil Drawing. The fencing shall be stretched before being snubbed and guyed. Existing crossing fences shall be connected to the new fences and corner posts with braces which shall be placed at junctions with existing fences. The barbed wire shall be drawn taut and fastened to posts with staples.

- 556.4 Submittal Required. All shipments shall include certification from the appropriate wood treatments plant. This certificate shall also state that all samples representing each lot have been tested and inspected in accordance with American Wood Preservers' Association Standard M2, "Inspection of Treated Products" and have been found to meet the requirements of the Latest Edition of applicable American Wood Preservers' Association standards for wood treatment for its intended use.

The Contractor shall submit manufacturer's certification that materials meet the requirements of this Item.

- 556.5 Measurement. Fencing will be measured by the linear foot, in-place, including gates. When noted in the bid documents, gates may be measured separately.

556.6 Payment. The work performed and the material furnished and installed as prescribed by this Item and measured as provided under measurement will be paid for at the contract unit price bid for "Four Strand Barbed Wire Fence", which prices shall be full compensation for furnishing and installing all fence material, including gates; for all preparation, hauling and installing of same; and for all labor, tools, equipment and incidentals necessary to complete the work, including excavation, back filling and disposal of surplus material. When noted in the bid documents, gates may be paid for separately.

There are line code(s), description(s) and unit(s) for this Item.

NOTE: This Item requires a Civil Standard Drawing that shall be incorporated into the contract documents.

NOTE: This Item requires other Standard Specifications.

Item 421 "Structural Concrete"
Item 457 "Timber Preservative and Treatment"
Item 550 "Existing Fencing and Gates"

END OF ITEM 556

ITEM 660

REFLECTORIZED PAVEMENT MARKINGS

- 660.1 Description. This Item shall govern for furnishing and installing reflectORIZED pavement markings of the types, colors, shapes, sizes, widths and thickness shown on the plans.
- 660.2 Materials.
- A. Type I Marking Materials. Type I markings are thermoplastic type materials that require heating to elevated temperatures for application. Type I marking materials shall conform to Texas Department of Transportation Materials Specification DMS-8220. Each container of Type I marking material shall be clearly marked to indicate the color, weight, type of material, manufacturer's name and the lot/batch number.
 - 1. Submittal. Submit supplier's certification verifying shelf life of Type I thermoplastic material.
 - B. Type II Marking Materials. Type II markings are paint-type materials that are applied at ambient or slightly elevated temperatures. Type II marking materials shall be in conformance with Item 661 "Traffic Paint (Solvent Based) and Item 662 "Glass Reflective Spheres for Traffic Paint".
- 660.3 Equipment Requirements. Equipment used to place pavement markings shall:
- A. Be maintained in satisfactory operating condition.
 - B. Be considered in satisfactory operating condition if it has an average placement rate of 5,000 linear feet per hour of acceptable 4 inch solid or broken lines over any 5 consecutive working days.
 - C. Meet or exceed the material handling at elevated temperatures requirements of the National Fire Underwriters and the Texas Railroad Commission.
 - D. Be capable of placing a minimum of 40,000 linear feet of 4 inch solid or broken markings per working day.
 - E. Have production capabilities similar to 4 inch marking equipment and shall be capable of placing linear markings up to 8 inches in

width in a single pass when used for placing markings in widths other than 4 inches.

- F. Have production capabilities considered satisfactory by the Engineer when used to place markings other than solid or broken lines.
- G. Be capable of placing a center-line and no-passing barrier-line configuration consisting of 1 broken line with 2 solid lines at the same time to the alignment and spacing shown on the plans.
- H. Be capable of placing broken and/or continuous white line from both sides.
- I. Be capable of placing lines with clean edges and of uniform cross-section. All lines shall have a tolerance of $\pm 1/8$ inch per 4 inch width.
- J. Have an automatic cut-off device with manual operating capabilities to provide clean, reasonably square marking ends to the satisfaction of the Engineer, and to provide a method of applying broken line in an approximate stripe-to-gap ratio of 15 to 25. The length of the stripe shall not be less than 15 feet or more than 15.5 feet. The total length of any stripe-gap cycle shall not be less than 39.5 feet or more than 40.5 feet.
- K. Provide continuous mixing and agitation of the pavement marking material. The use of pans, aprons or similar appliances which the die overruns will not be permitted for longitudinal striping applications.
- L. Apply beads by an automatic bead dispenser attached to the pavement marking equipment in such a manner that the beads are dispensed uniformly and almost instantly upon the marking as the marking is being applied to the road surface. The bead dispenser shall have an automatic cut-off control, synchronized with the cut-off of the pavement marking equipment.

When Type I markings are to be placed, the Contractor shall have a hand-held thermometer on the project. The thermometer shall be capable of measuring the temperature of the pavement marking material to be placed.

660.4 Construction Methods.

- A. General. When required by the Engineer, the Contractor and the Engineer shall review the sequence of work to be followed and estimated progress schedule.

Markings may be placed on roadways either free of traffic or open to traffic. On roadways already open to traffic, the markings shall be placed under traffic conditions that exist with a minimum of interference to the operation of the facility. Traffic control shall be as shown on the plans or as approved by the Engineer in writing. All markings placed under open-traffic conditions shall be protected from traffic damage and disfigurement. On roadways open to traffic, with 3 lanes of travel in one direction, all markings shall be placed from the outside lanes only, unless otherwise approved in writing by the Engineer.

Guides, to mark the lateral location of pavement markings shall be established as shown on the plans or as directed by the Engineer. The Contractor shall establish the pavement marking guides and the Engineer will verify the location of the guides.

Markings shall be placed in proper alignment with the guides. The deviation rate in alignment shall not exceed 1 inch per 200 feet of roadway. The maximum deviation shall not exceed 2 inches nor shall any deviation be abrupt.

Markings shall have a uniform cross-section. The density and quality of markings shall be uniform throughout the marking. The applied markings shall have no more than 5 percent, by area, of holes or voids, and shall be free of blisters.

Markings, in place on the roadway, shall be reflectorized both internally and externally. Glass beads shall be applied to the materials at a uniform rate sufficient to achieve uniform and distinctive retroreflective characteristics when observed in accordance with TxDOT's Test Procedure Tex-828-B.

The Contractor's personnel shall be sufficiently skilled in the work of installing pavement markings.

If the Contractor's placement of the markings is not in alignment or sequence, as shown on the plans or as stated in this Item, shall be removed by the Contractor at the Contractor's expense. Removal shall be in accordance with Item 674 "Removing Pavement Striping and Markings" except for measurement and payment. Guides placed on the roadway for alignment purposes shall not establish a permanent marking on the roadway.

Unless otherwise shown on the plans, pavement markings may be applied by any method that will yield markings meeting the requirements of this Item.

- B. Surface Preparation. New portland cement concrete surfaces shall be cleaned in accordance with Item 669 "Pavement Surface Preparation for Markings" to remove curing membrane, dirt, grease, loose and/or flaking existing construction markings and other forms of contamination.

Older portland cement concrete surfaces and asphaltic surfaces that exhibit loose and/or flaking existing markings shall be cleaned in accordance with Item 669 "Pavement Surface Preparation for Markings", to remove all loose and flaking markings.

Pavement to which material is to be applied shall be completely dry. Pavement shall be considered dry if, on a sunny day after observation for 15 minutes, no condensation occurs on the underside of a one (1) foot square piece of clear plastic that has been placed on the pavement and weighted on the edges.

- C. Application of Type II Markings.

The application of Type II marking materials shall be done only on surfaces with a minimum surface temperature of 50 F.

The application rate for Type II marking material shall be:

1. between 15 and 20 gallons per mile of solid 4 inch line and
2. between 30 and 40 gallons per mile for solid 8 inch line

For new surface treatment projects (e.g. one course surface treatment, etc.) the application rate shall be:

1. between 25 and 30 gallons per mile of solid 4 inch line and
2. between 40 and 50 gallons per mile for solid 8 inch line.

Pavement marking for new surface treatment projects shall be applied in 2 applications each approximately one-half the application rates specified in the paragraph above. The first application shall not contain glass beads. The interval between the first and second applications shall be a minimum of 1 hour.

In the case of inclement weather, if the Engineer has directed the Contractor to apply water-based traffic paint, and the markings are damaged by subsequent rain, sleet, hail, etc., the Contractor will be paid for the initial placement and the replacement markings. However, if the Contractor placed the markings at his option, the Contractor is responsible for all costs associated with the replacement markings.

- D. Application of Type I Markings. New portland cement concrete surfaces shall be further prepared for Type I markings, after cleaning, by placing a Type II marking as a sealer in accordance with this Item.

Type II markings shall be placed a minimum of 2 and a maximum of 30 calendar days in advance of placing Type I markings when placing Type I markings on:

1. asphaltic surfaces 3 years old or older, or
2. any portland cement concrete.

Type II markings which become dirty due to inclement weather or road conditions shall be cleaned by washing, brushing, compressed air or other means approved by the Engineer, prior to application of Type I markings. If washing is used, the surface of Type II markings shall become thoroughly dry before placing Type I markings. Color, location and configuration of Type II markings shall be the same as that of Type I markings.

Type I pavement marking material shall be applied within temperature limits recommended by the material manufacturer. Type I pavement markings shall be applied only on clean, dry pavement having a surface temperature above 50° F. Pavement temperature shall be measured in accordance with TxDOT's Test Procedure Tex-829-B.

When Type I pavement marking is applied by spraying, and operations cease for 5 minutes or more, the spray head shall be flushed by spraying pavement marking material into a pan or similar container until the pavement marking material being sprayed is at the proper temperature for application.

Unless otherwise shown on the plans, Type I marking minimum thickness shall be 0.060 inches (60 mil) for edgeline markings and 0.090 inches (90 mil) for stop-bars, legends, symbols, gore and center-line/no-passing barrier-line markings, when measured in

accordance with TxDOT's Test Procedure Tex-854-B. The maximum thickness of all Type I markings shall be 0.180 inches (180 mil).

The thickness of Type I markings at the time of placement will be measured above the plane formed by the pavement surface. The Engineer will supply a device to measure the thickness of the applied markings. The markings shall be of uniform thickness throughout their lengths and widths.

660.5 Performance Period for Type I Markings.

Type I pavement markings shall meet all requirements of this Item for a minimum of 15 calendar days after installation. Pavement markings that fail to meet all requirements of this Item shall be removed and replaced by the Contractor at the Contractor's expense. The Contractor shall replace all pavement markings failing the requirements of this Item within 30 calendar days following notification by the Engineer of the failure. All replacement markings shall also meet all requirements of this Item for a minimum of 15 calendar days after installation.

660.6 Measurement.

Reflectorized Pavement Markings will be measured by the linear foot, or by each for the various words, symbols or shapes, or by any other unit as shown on the bid documents.

Where double stripes are placed, each stripe will be measured separately.

Type II pavement markings requiring two applications on new surface treatments will be measured as one marking.

Type II pavement marking materials, when used as a sealer for Type I markings will be considered incidental to the Type I markings.

660.7 Payment.

The work performed and the materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Reflectorized Pavement Markings" of the various types, colors, shapes, sizes, widths, and thickness (Type I markings only) specified. Type II pavement markings used as a sealer for Type I markings will be considered incidental to the Type I markings. This price shall be full compensation for furnishing all materials; surface preparation for application of pavement markings; and for all other labor, tools,

equipment and incidentals necessary to complete the work, except as shown below.

Final Work Zone Pavement Markings (paint and beads) which will be used as a sealer for Type I pavement markings will be paid for under Item 665.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 661 "Traffic Paint (Solvent Based)"

Item 662 "Glass Reflective Spheres for Traffic Paint"

Item 665 "Work Zone Pavement Markings"

Item 669 "Pavement Surface Preparation for Markings"

Item 674 "Removing Pavement Striping and Markings"

END OF ITEM 660

ITEM 671

TRAFFIC CONTROL

- 671.1 Description. This shall govern for furnishing, installing, moving, replacing, maintaining, cleaning and removing upon completion of work, all barricades, signs, barriers, barrels, cones, lights, delineators, pavement markings, and other such devices and detours in conformance with the drawings or as directed by the Engineer.

A Traffic Control Plan (TCP) has been established for this project in accordance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD). The Contractor may propose an alternate TCP, and if the alternate plan is approved by the Engineer, it may be used. The alternate TCP must be prepared in accordance with Harris County Traffic Control Guidelines (Latest Edition) and sealed by a Professional Engineer registered in the State of Texas proficient in the field of Traffic Engineering.

- 671.2 Construction Methods. All barricades, signs and other types of traffic control devices shall conform to details shown on the drawings, and those indicated in Part VI of the TMUTCD.

Prior to beginning work, the Contractor shall designate in writing a competent person who will be responsible and available on the project site or in the immediate area to insure compliance with the TCP.

The Contractor is solely responsible for furnishing, erecting and maintaining all barricades, signs, barriers, barrels, cones, lights, delineators, pavement markings, and other such devices as necessary to adequately protect the project and workers and warn, advise and safeguard the traveling public over the entire length of the project. The Contractor's responsibility in this regard extends for the entire duration of the project, from the start of construction until acceptance by the County.

All reflective traffic control devices such as barricades, vertical panels, signs, etc. shall be maintained at all times by cleaning, replacing or a combination thereof such that during darkness and rain the reflective characteristics shall equal or exceed the retroreflective characteristics of the standard reflective panels in the Engineer's possession. Unless otherwise set forth in these Standard Specifications, the Contractor shall receive compensation for furnishing, erecting and maintaining the necessary barricades, signs, barriers, barrels, cones, lights, delineators, pavement markings, other such devices and any incidentals necessary for

the good and proper safety, convenience and direction of traffic prior to final inspection and acceptance by the County.

Detours and temporary structures necessary for public travel during the prosecution of the work will be indicated on the TCP and the cost included in the bid and contract price. Any necessary detours or temporary structures not indicated on the drawings or provided for in the specifications shall be at the expense of the Contractor. Increased maintenance costs incurred incidental to resulting traffic over an established road, street, or highway as a result of any detour shall not be considered as a cost of maintaining detours and will be paid for by the Contractor.

The Contractor shall provide at his expense, means of ingress and egress for all residents and businesses along any closed section of the work and shall provide property owners a means of access to a public road.

Temporary access driveways shall provide an all-weather surface and shall be maintained by the Contractor in a condition acceptable to the Engineer. Where indicated in the bid documents, asphalt millings may be used for temporary driveways.

No section of the work shall be closed to traffic until so directed by the Engineer. No bridge, culvert or drainage structure shall be closed until an adequate detour has been arranged and constructed.

If, in the opinion of the Engineer, the Contractor does not comply with the above requirements such work as the Engineer may deem necessary for the safety, comfort and convenience of the traveling public may be performed and the charges therefore withheld from any money due or to become due to the Contractor. The Contractor shall not be paid to provide traffic control during delays caused by the Contractor.

The above does not preclude the requirements of the "Harris County General Conditions".

Providing, installing, moving, replacing, maintaining, cleaning and removing upon completion of work all barricades, signs, barriers, barrels, cones, lights, delineators, pavement markings, and other such devices shall be in accordance with Item 665 "Work Zone Pavement Markings", Item 670 "Barricades", Item 696 "Low Profile Concrete Barrier" and Item 698 "Temporary Polyethylene Water-Filled Barrier". Flagmen shall be furnished, maintained and possess the minimum qualification and requirements stipulated in the TMUTCD. Operation of flagmen shall be as outlined in Item 672 "Flagmen."

Temporary pavement markings shall be in accordance with Item 665 "Work Zone Pavement Markings".

Temporary signs and supports shall be made from wood, metal, or other approved materials. Wood for signs shall be minimum 1/2 inch, medium density, outdoor grade plywood. Metal signs shall be in conformance with Item 624 "Aluminum Signs". Reflectorized sign sheeting shall be in conformance with Item 649 "Wide Angle Prismatic Retroreflective Sheeting for Traffic Control Signs (Diamond Grade)." Signs may be erected on portable, temporary, or fixed supports for use in the work zone. Signs erected on portable supports shall be for daytime use only. All wood supports shall be painted white. Sandbags shall be used where portable or temporary sign supports require the use of weights to prevent a sign assembly from falling over. All signs shall be placed in accordance with the drawings and the TMUTCD.

671.3 Measurement & Payment. Barricades, signs, barriers, barrels, cones, lights, delineators, and other such devices shall be paid for by the month or per each Jobsite, provided the traffic control plan is properly installed and maintained. This includes preparation of an alternative Traffic Control Plan by the Contractor, if any, and approved by the Engineer.

Detours shall be paid for in accordance with Item 673 "Constructing Detours for Maintaining Two-Way Traffic".

Work Zone Pavement Markings shall be paid for in accordance with Item 665 "Work Zone Pavement Markings".

Barriers designated as "Low Profile Concrete Barrier" and "Temporary Polyethylene Water-Filled Barrier" shall be paid for in accordance with Items 696 and 698 respectively.

Temporary driveways and the removal of temporary driveways shall be measured and paid for as follows: "Temporary Commercial Driveways per Each" and "Temporary Residential Driveways per Each". Payment shall include all labor and materials, including shaping, furnishing and hauling necessary to complete the work.

There are line code(s), description(s) and unit(s) for this Item:

NOTE: This Item requires other Standard Specifications.

Item 624 "Aluminum Signs"

Item 649 "Wide Angle Prismatic Retroreflective Sheeting for Traffic Control Signs (Diamond Grade)"

Item 665 "Work Zone Pavement Markings"

Item 670 "Barricades"

Item 672 "Flagmen"

Item 673 "Constructing Detours for Maintaining Two-Way Traffic"

Item 696 "Low Profile Concrete Barrier"

Item 698 "Temporary Polyethylene Water-Filled Barrier"

END OF ITEM 671

ITEM 713

REINFORCED FILTER FABRIC BARRIER

713.1 Description. This Item shall govern for furnishing, installing, and removing temporary erosion protection and sediment control reinforced filter fabric barrier in accordance with these Standard Specifications and construction drawings, and as directed by the Engineer. The reinforced filter fabric barrier consists of geotextile fabric supported by a net reinforced fence stretched across and attached to supporting posts or frame and entrenched. This work shall be performed during construction operations and prior to final stabilization to control erosion and sedimentation.

713.2 Materials. Geotextile fabric (filter fabric) shall consist of long-chain synthetic polymers composed of at least 95 percent by weight of polyolefins in a woven fabric. The geotextile fabric shall meet or exceed the following specifications:

TABLE 1

SILT FENCE GEOTEXTILE FABRIC PROPERTIES			REQUIREMENTS UNSUPPORTED SILT FENCE	
	Units	Supported Silt Fence	Geotextile Elongation ≥50%	Geotextile Elongation <50%
Grab Strength				
Machine Direction	Lbs.	90	123	123
X-Machine Direction	Lbs.	90	100	100
Permittivity	Sec ⁻¹	0.05	0.05	0.05
Apparent Opening Size (Max. Average Roll Value)	Mm/sieve	0.6/30	0.6/30	0.6/30
Ultraviolet Stability (Retained Tensile Strength)	%	70 after 500 hrs exposure	70 after 500 hrs exposure	70 after 500 hrs exposure

NOTES:

1. Table 1 adapted from AASHTO M 288 *Geotextile Specification for Highway Applications* Table 6. Temporary Silt Fence Property Requirements.
2. All numeric values in Table 1 except Apparent Opening Size (AOS) represent minimum average roll values (MARV). Values for AOS represent maximum average roll values.

Geotextile fabric shall contain stabilizers and/or inhibitors to make the fabric resistant to deterioration resulting from exposure to sunlight or heat. Geotextile fabric shall be resistant to commonly encountered soil chemicals, mildew, rot, and insects. Geotextile fabric shall be free of defects or flaws that affect its physical and/or filtering properties. Geotextile fabric shall provide an expected useable life comparable to the anticipated construction period.

Fence posts shall be either steel or hardwood, essentially straight, with a minimum length of 4 feet. Hardwood posts shall be 2 inch x 2 inch minimum, or equivalent. Metal posts shall be either studded T or U steel type with a minimum weight of 1.28 lbs. per linear foot. Fin anchors shall be used to resist post movement as directed by the Engineer.

Net reinforced fence shall be 2 inch wide by 4 inch high welded wire fabric mesh, 14 gauge minimum. The mesh support height shall be the equivalent height, or greater, of the geotextile fabric to be attached. Plastic grid mesh or other support mesh may be substituted for welded wire mesh as approved by the Engineer.

Attachment of net reinforced fence and geotextile fabric shall be with wire ties, staples, or rings. Wire ties shall be 14 gauge minimum, staples shall be no. 9 wire minimum with a 1/2 inch minimum crown length, and rings shall be galvanized, or as approved by the Engineer.

A prefabricated unit with geotextile fabric, posts, and wire mesh meeting the minimum specifications in this Item may be used in lieu of a constructed filter fabric barrier.

713.3 Construction Methods. No clearing and grubbing or rough cutting, other than as specifically directed by the Engineer to allow for soil testing, surveying and installation of erosion protection and sediment control measures, shall be permitted until sediment control and erosion protection systems are in place.

Reinforced filter fabric barriers shall be so installed that the surface runoff will percolate through the system and allow sediment to be retained and accumulated, and may be used in conjunction with a rock filter dam (Item 750) at the outfall of a detention pond. Reinforced filter fabric barrier shall not be used as the sole best management practice at the outfall of a detention pond. Reinforced filter fabric barriers shall be installed at the locations shown on the construction drawings and in accordance with the Standard Civil Drawing or as directed by the Engineer. Reinforced filter fabric barriers shall be constructed in accordance with an approved schedule that clearly describes the timing during the construction process that the various erosion control measures will be implemented. Reinforced

filter fabric barriers shall be installed so as surface runoff will percolate through the system and allow sediment to be retained and accumulated.

Posts shall be driven to a minimum depth of 1 foot into the ground. Posts shall be a minimum of 18 inches above the ground. Posts shall be placed with a maximum spacing of 6 feet and be installed on a slight angle toward the anticipated runoff.

Trenches shall be dug along the uphill side of the fence to anchor at least 8 inches of the filter fabric to prevent underflow. The trench shall be a 6 inch x 6 inch square, or a 4 inch deep V-trench.

Net reinforced fence shall be attached to the posts. Attachment shall be at the top and mid-section. Additional ties or staples shall be added to secure the net reinforced fence to the posts as directed by the Engineer.

Geotextile fabric shall be placed against the side of the trench with approximately 2 inches across the bottom in the upstream direction. Using wire ties or rings, the geotextile fabric shall be attached to the net reinforced fence. The fabric shall be attached at the top and mid-section. The horizontal spacing of the attachment shall be every 24 inches, or less. Additional ties, rings, or staples shall be added to secure fabric to the net reinforced fence or posts as directed by the Engineer.

Geotextile fabric shall be provided in continuous rolls and cut to the length of the barrier, so as to minimize joints. When joints of two sections of fabric are necessary, the fabric shall be spliced together only at a support post. The fabric shall be overlapped a minimum of 6 inches at a post, folded, and secured at six or more places. Splices in concentrated flow areas will not be permitted.

Geotextile fabric shall be attached at the end posts at a minimum of four locations. Geotextile fabric shall be entrenched and attached to the posts so as a minimum of 18 inches of the fabric is above the ground. The trench then shall be backfilled and hand tamped as approved by the Engineer.

Contractor shall inspect the reinforced filter fabric barriers at least once every week or as directed by the Engineer. The Contractor shall remove irregularities which will impede normal flow. Erosion protection and sediment control systems shall be maintained by the Contractor until final stabilization. Damage caused to erosion protection and sediment control systems shall be repaired immediately. (Note: Maintenance for Item 713 is paid for under Item 751 "SWPPP Inspection and Maintenance")

The Contractor is responsible for removal and proper disposal of sediment and debris from the reinforced filter fabric barrier system and as directed by the Engineer. Sediment and debris shall not be allowed to flush into the storm sewer system, waterways, and jurisdictional wetlands, or onto adjacent properties. Sediment deposits shall be removed before they reach one-third of the height of the reinforced filter fabric barrier.

Uncontaminated sediment can be placed at the project spoil site protected by a reinforced filter fabric barrier or, if properly handled, spread out to supplement fill requirements. The Engineer will designate how the sediment deposits are to be handled. Uncontaminated sediment shall not be placed in waterways or jurisdictional wetlands, unless as approved by the Engineer. If sediment has been contaminated, then it shall be disposed of in compliance with current local, State and Federal Regulations. Offsite disposal shall be the responsibility of the Contractor.

After final stabilization and at the direction of the Engineer, the Contractor, when required, shall be responsible for removing all erosion protection and sediment control systems that are not permanent, from the project.

- 713.4 Quality Assurance. The Contractor is responsible for the control of the quality of materials incorporated into the construction and the quality of completed construction. The County will engage materials engineering services to provide quality assurance testing and inspection to assist the Engineer in determining the acceptability of materials and completed construction. Quality assurance services provided by the County do not relieve the Contractor of his responsibility for quality control. The Materials Engineer shall not have control of the means, methods, techniques, sequences or procedures of construction selected by the Contractor.
- 713.5 Measurement. When paid for separately as a pay item, measurement for reinforced filter fabric barrier shall be by the linear foot, complete in place, measurement being made along the centerline of the top of the barrier.
- 715.6 Payment. Payment for reinforced filter fabric barrier shall include and be full compensation for all labor, equipment, materials, supervision and all incidental expenses for the construction of this Item, complete in place, where 60 percent of the total unit cost shall be for furnishing and installing all materials. Thus, 40 percent of the total unit cost shall be for the removal and disposal of erosion protection and sediment control systems: reinforced filter fabric barrier, after final stabilization, at the end of the project.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires a Standard Civil Drawing that shall be incorporated into the contract documents.

NOTE: This Item requires other Standard Specifications.

Item 751 "SWPPP Inspection and Maintenance"

END OF ITEM 713

ITEM 724

STABILIZED CONSTRUCTION ACCESS

724.1 Description. This Item shall govern for furnishing and installing temporary erosion protection and sediment control stabilized construction access, utilized during construction operations and prior to final stabilization, in accordance with these Standard Specifications and construction drawings, and as directed by the Engineer.

724.2 Materials. Geotextile fabric shall consist of a woven monofilament or spunbond nonwoven fibers consisting of long-chain synthetic polymers composed of at least 95 percent by weight of polyolefins. Geotextile fabric shall equal or exceed the following average roll values or as directed by the Engineer:

A. Minimum average roll value.

1. Elongation \geq 50%.
2. Grab Strength – 200 pounds.
3. Puncture Strength – 75 pounds.
4. UV Stability (retained strength) – 50% after 500 hours of exposure.

B. Maximum average roll value.

1. Apparent Opening Size (AOS) – 0.6 mm/#30 US sieve.

Geotextile fabric shall be resistant to commonly encountered soil chemicals, mildew, rot, insects, and deterioration resulting from exposure to sunlight or heat. Geotextile fabric shall provide an expected useable life comparable to the anticipated construction period.

Aggregate for the construction access shall consist of crushed stone, gravel, or furnace slag, or combination thereof. The aggregate shall be open graded with a size of 2 inches to 5 inches with no material diameter less than 2 inches and no material diameter greater than 5 inches. Aggregate particles shall be composed of clean, hard, durable materials free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials or organic and injurious matter. Prior to installation, all exposed metal, including reinforcing steel and wire mesh, shall be cut off flush with the surface of the crushed concrete. The depth of the aggregate shall not be less than 8 inches.

Aggregate shall be cubic or rounded form, not elongated, flat, shapes. Spalls, fragments, and chips shall not exceed 5 percent by weight.

724.3 Construction Methods. No clearing and grubbing or rough cutting, other than as specifically directed by the Engineer to allow for soil testing, surveying and installation of erosion protection and sediment control measures, shall be permitted until sediment control and erosion protection systems are in place.

Stabilized construction access shall be installed at the locations shown on the construction drawings and in accordance with the Standard Civil Drawing or as directed by the Engineer. Stabilized construction access shall be constructed in accordance with an approved schedule that clearly describes the timing during the construction process that the various erosion control measures will be implemented. Stabilized construction access shall be installed so as to prevent tracking or flowing of sediment from the construction site.

The construction access location shall be graded to provide sufficient drainage away from the proposed stabilized area. The separation geotextile fabric shall be placed to the width and length of the construction access. Aggregate shall be placed on the underlying separation geotextile fabric to the width and length of the fabric and to the specified depth, with the depth being no less than 8 inches. The separation geotextile fabric may be omitted only as approved by the Engineer.

When necessary, equipment, truck, and vehicle wheels shall be cleaned to remove sediment prior to entrance onto public right-of-way. When washing is required, the construction access shall be graded to drain into a sediment trap or sediment basin. The sediment trap or sediment basin for the washing area shall be the size and location shown on the construction drawings or as directed by the Engineer.

Details for stabilized construction access are shown on the drawing that is incorporated into the Standard Civil Drawings. Stabilized construction access shall be at least 14 feet wide for one way traffic and 20 feet for two way traffic and shall be sufficient for all ingress and egress unless as approved by the Engineer due to site conditions. Length of the stabilized area shall be as shown on the construction drawings, but not less than 50 feet, unless approved by the Engineer due to site conditions.

The Contractor shall provide stabilized construction access for project related access roads, parking areas, and other on-site vehicle transportation routes. Stabilization of these areas shall have the same

aggregate and thickness requirements as the stabilized construction access unless shown otherwise on the construction drawings.

Gravel bags, boards, reinforced filter fabric fence, or similar methods shall be used in combination with the stabilized construction access to prevent sediment from entering public right-of-way, storm sewer system, jurisdictional wetlands, and waterways.

The Contractor shall provide periodic top dressing, with additional aggregate, to maintain the required access roadway depth. The Contractor shall be responsible for repairing and cleaning out damaged areas used to trap sediment. All sediment and aggregate tracked or washed into public right-of-way, storm sewer system, jurisdictional wetlands or waterways shall be removed immediately.

The Contractor shall inspect the stabilized construction access at least once every week or as directed by the Engineer. Damage caused to stabilized construction access shall be repaired immediately. Stabilized construction access shall be maintained by the Contractor until construction staging requires removal or upon final stabilization of the construction site. Upon removal of the stabilized construction access, the area shall be graded as per the construction drawings and stabilized with vegetation, or other. (Note: Maintenance for Item 741 is paid for under Item 751 "SWPPP Inspection and Maintenance")

If an equipment or vehicle washing area is necessary, The Contractor is responsible for removal and proper disposal of sediment and debris from the sediment trap or basin. Sediment and debris shall not be allowed to flush into the storm sewer system, waterways, jurisdictional wetlands, or onto adjacent properties. Sediment deposits shall be removed before they reach 1/3 of the depth of the sediment trap or basin.

Uncontaminated sediment can be placed at the project spoil site or, if properly handled, spread out to supplement fill requirements. The Engineer will designate how the sediment deposits are to be handled. Uncontaminated sediment shall not be placed in waterways or jurisdictional wetlands, unless as approved by the Engineer. If sediment has been contaminated, then it shall be disposed of in compliance with current local, State and Federal Regulations. Offsite disposal shall be the responsibility of the Contractor.

After final stabilization and at the direction of the Engineer, the Contractor, when required, shall be responsible for removing all erosion protection and sediment control systems that are not permanent, from the project.

- 724.4 Quality Assurance. The Contractor is responsible for the control of the quality of materials incorporated into the construction and quality of completed construction. The County will engage materials engineering services to provide quality assurance testing and inspection to assist the Engineer in determining the acceptability of materials and completed construction. Quality assurance services provided by the County do not relieve the Contractor of his responsibility for quality control. The Materials Engineer shall not have control of the means, methods, techniques, sequences or procedures of construction selected by the Contractor.
- 724.5 Measurement. When paid for directly as a pay item, measurement for stabilized construction access shall be by the square yard, complete and in place.
- 724.6 Payment. Payment for stabilized construction access shall include and be full compensation for all labor, equipment, materials, supervision and for all incidental expenses for the construction of these items, complete in place, where 60 percent of the total unit cost shall be for the furnishing and installing materials including excavation. Thus, 40 percent of the total unit cost shall be for the removal of erosion protection and sediment control systems: stabilized construction access, after final stabilization, at the end of the project. Construction and maintenance of sediment traps or basins associated with the stabilized construction access for the purpose of washing equipment or vehicles prior to egress to public right-of-way shall be considered incidental to stabilized construction access.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires a Standard Civil Drawing that shall be incorporated into the contract documents.

NOTE: This Item requires other Standard Specifications.

Item 751 "SWPPP Inspection and Maintenance"

END OF ITEM 724

ITEM 730

CONCRETE TRUCK WASHOUT STRUCTURES

- 730.1 Description. This Item shall govern for furnishing, installing and removing concrete washout structures. The description for maintenance is included in this Item, but payment for maintenance is part of Item 751 "SWPPP Inspection and Maintenance".
- 730.2 Submittals. Concrete truck washout structure shall be used per Standard Civil Drawing.
- Submit site plan showing location(s) of concrete truck washout structure(s) for approval.
- Submit plan for disposal of both concrete truck washout water and solid concrete wastes for approval.
- 730.3 Concrete Truck Washout Structure. Refer to the Standard Civil Drawing detail for "Concrete Truck Washout Structure", with sandbags.
- 730.4 Placement. Do not locate concrete washout structures within 50 feet of storm drain inlets, open drainage facilities or watercourses.
- Locate away from construction traffic or access areas to prevent disturbance or tracking.
- 730.5 Construction. Install a sign adjacent to each temporary concrete washout structure to inform concrete equipment operators to utilize the proper facilities. See Detail sheets for sign dimensions.
- Detail – "Below Grade Concrete Truck Washout Structure with Sandbags".
- A. Construct temporary concrete truck washout structures below grade with a minimum length and width of 10 feet. Construct and maintain concrete truck washout structures in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
 - B. Remove rocks and other debris in soil base of structure that might tear or puncture the plastic lining.
 - C. Provide plastic lining material which is a minimum of 10 mil thick polyethylene sheeting. Sheeting shall be free of holes, tears or other defects that compromise the impermeability of the lining. Install lining seams in accordance with manufacturers' recommendations.

- D. Provide sandbags to hold plastic lining in place.
- E. Install 15 feet by 35 feet by 8 inches thick granular fill truck parking pad underlain with geotextile per Item 724 "Stabilized Construction Access".
- F. Install orange safety fence around three sides of the structure as shown on the drawing detail.

730.6 Maintenance. Once concrete wastes are washed into the designated structure and allowed to harden, break up the concrete, remove and dispose in accordance with approved submittal.

Inspect lining integrity and level in concrete washout structure before each rainfall to prevent overtopping due to rainfall and daily during periods of daily rainfall and, at a minimum, once every week.

Repair or replace damaged lining or other damaged or missing parts of the washout structure immediately.

Maintain level in washout structure(s) to provide adequate holding capacity with a minimum freeboard of 12 inches.

Existing washout structure(s) must be cleaned, or new washout structure(s) constructed and ready for use once the washout structure is 75 percent full. Contractor is responsible for any concrete washed out in other location. (Note: Maintenance for Item 730 is paid for under Item 751 "SWPPP Inspection and Maintenance")

730.7 Removal of Concrete Washout Structures. Once concrete washout structures are no longer required, as determined by the Engineer, remove and dispose the hardened concrete and concrete washout water per the approved submittal.

730.8 Material Disposal. Dispose materials used to construct truck washout structure(s) and granular fill parking pad(s) in compliance with current local, State and Federal Regulations.

Remove unusable, objectionable or excess material from the construction work area. Dispose of such material in compliance with current local, State and Federal Regulations.

Disposal of material in the 100-year flood plain without permits is prohibited.

Disposal of material in wetlands or other environmentally sensitive areas without permits is prohibited.

Material disposed of without permits shall be removed and properly disposed of at no cost to the County. Restore the site at no cost to the County.

730.9 Site Restoration. Compact clean fill in pit up to surrounding grade.

Backfill and repair all holes, depressions or other ground disturbances caused by the construction and removal of the concrete washout structure(s).

Restore concrete washout structure area to match surrounding grade and vegetation.

730.10 Measurement. Measurement is as noted as lump sum. No separate measurement will be made for maintenance or removal of accumulated washout structure wastes.

730.11 Payment. Payment is lump sum, for the duration of the project. Payment shall include and be full compensation for all labor, equipment, materials, supervision and for all incidental expenses for the installation of concrete washout structures, complete in place, where 60 percent of the total cost shall be for the furnishing and installation with embankment and excavation. Thus, 40 percent of the total cost shall be for the removal of concrete truck washout structures, after final stabilization, at the end of the project.

No separate payment will be made for maintenance or removal of accumulated washout structure wastes, per this Item. Removal of the concrete washout structure and site restoration is a part of the cost bid for the concrete washout structure. For the Below Grade Concrete Washout Structure shown on the Standard Civil Drawing detail, the sandbags and geotextile are incidental to the cost of the concrete truck washout structure.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires a Standard Civil Drawing that shall be incorporated into the contract documents.

NOTE: This Item requires other Standard Specifications.

Item 724 "Stabilized Construction Access"

Item 751 "SWPPP Inspection and Maintenance".

END OF ITEM 730

SPECIAL PROVISION TO TXDOT ITEM 1

"DEFINITION OF TERMS"

For this project, Item 1 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby:

THE TERM "DEPARTMENT," "STATE," "STATE HIGHWAY DEPARTMENT OF TEXAS", "TxDOT", "TEXAS DEPARTMENT OF TRANSPORTATION", STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION," "STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION COMMISSION," "COMMISSION," AND "STATE HIGHWAY COMMISSION," SHALL, IN THE USE OF THE STANDARD SPECIFICATIONS FOR ALL WORK IN CONNECTION WITH THIS PROJECT, BE DEEMED TO MEAN GALVESTON COUNTY, PARTY OF THE FIRST PART IN ACCOMPANYING CONTRACT OR CONTRACTS. ANY REFERENCE IN THE TEXAS STANDARD SPECIFICATIONS TO THE STATE OF TEXAS, ITS OFFICIALS, EMPLOYEES, OR AGENTS SHALL BE DEEMED TO MEAN GALVESTON COUNTY, ITS OFFICIALS, EMPLOYEES, OR AGENTS.

Articles 1.26, "Certificate of Insurance" ; 1.28, "Commission", 1.47, "Department", 1.70 "Letting Official " and 1.124 "State" are deleted.

Article 1.53, "ENGINEER", is revised to read in its entirety as follows:

1.53 ENGINEER. Galveston County Engineer or his authorized representatives. If a representative is authorized to function as the ENGINEER'S representative with respect to certain ENGINEER'S activities that representative's responsibilities and obligations shall be limited as provided in Article 1.148.

Article 1.64, "INSPECTOR," is revised to read in its entirety as follows:

1.64 INSPECTOR. The representative of the ENGINEER assigned and authorized to observe or inspect any or all parts of the work and the material to be used therein. A representative is authorized to function as the ENGINEER'S representative with respect to certain activities, and that representative's responsibilities and obligations shall be limited as provided in Article 1.148.

Special Provisions to TxDOT Item 1

"DEFINITION OF TERMS"

ADDITIONAL ARTICLES ARE ADDED AS FOLLOWS:

1.148 CONSULTING ENGINEER. Independent engineering firms contracting with Galveston County for the providing of professional engineering services. The engineering firms are the representatives of Galveston County only to the extent provided in the Contract documents and in such special instances where they are specifically authorized by Galveston County so to act. All powers and rights assigned by Galveston County to the engineering firms with respect to the work are solely and exclusively for the benefit of Galveston County and not for the CONTRACTOR. In carrying out of its powers and rights assigned by Galveston County the engineering firms shall function as a representative of Galveston County and shall act by and for Galveston County. Irrespective of what authority may be assigned by Galveston County to the engineering firms, CONTRACTOR remains fully and solely responsible and liable for its obligations to perform the work in accordance with the requirements of the plans and specifications; to insure against failures in safety precautions; to carry out his work pursuant to safe methods of construction; to select and fulfill the proper manner, means, and methods in performing the work in order to meet the plans and specifications; and to complete the work in accordance with the contract documents.

SPECIAL PROVISION TO TXDOT ITEM 2
INSTRUCTIONS TO BIDDERS

For this project, Item 2 of the Texas Standard Specifications is hereby deleted in its entirety.
The Instructions to Bidders is included elsewhere in the Contract Documents.

SPECIAL PROVISION TO TXDOT ITEM 3
AWARD AND EXECUTION OF CONTRACT

For this project, Item 3 of the Texas Standard Specifications is hereby deleted in its entirety.

The Award and Execution of Contract is included elsewhere in the Contract Documents.

SPECIAL PROVISION TO TXDOT ITEM 4

SCOPE OF WORK

For this project, Item 4 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 4.2 "CHANGES IN WORK;" ARTICLE 4.3 "DIFFERING SITE CONDITIONS" and ARTICLE 4.4 "REQUESTS AND CLAIMS FOR ADDITIONAL COMPENSATION" are deleted in their entirety and replaced by Article 41 "CHANGES and ALTERATIONS" and ARTICLE 42 "EXTRA WORK" of "Special Provisions for Construction".

SPECIAL PROVISION TO TXDOT ITEM 5

CONTROL OF THE WORK

For this project, Item 5 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 5.2 "PLANS AND WORKING DRAWINGS." The first sentence of the first paragraph is hereby revised to read as follows:

When required, the Contractor shall provide working drawings to supplement the plans with all necessary details not included on the Contract plans.

ARTICLE 5.5 "COOPERATION OF CONTRACTOR." The last sentence of the first paragraph is hereby revised to read as follows:

The Contractor will be supplied with three (3) copies of the plans, specifications and special provisions and he shall have one (1) copy of each available on the project at all times.

ARTICLE 5.6 "CONSTRUCTION SURVEYING," is hereby deleted in its entirety.

ARTICLE 5.7 "INSPECTION." The sixth sentence of the second paragraph is hereby revised to read as follows:

If the uncovered work is acceptable, the costs to uncover, remove and replace or make good the parts removed will be paid for in accordance with Article 41. "Changes and Alterations" of "Special Provisions for Construction".

ARTICLE 5.8 "FINAL ACCEPTANCE," is hereby deleted in its entirety. It is replaced by Article 6(b). "PAYMENTS TO CONTRACTOR, FINAL PAYMENT" of "Special Provisions for Construction".

SPECIAL PROVISION TO TXDOT ITEM 6

CONTROL OF MATERIALS

For this project, Item 6 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 6.1 "SOURCE CONTROL." Paragraph A. "Buy America" and B. "Buy Texas" are hereby deleted in their entirety.

ARTICLE 6.7 "Department-furnished Material" is hereby deleted in its entirety.

SPECIAL PROVISION TO TXDOT ITEM 7
LEGAL RELATIONS AND RESPONSIBILITIES

For this project, Item 7 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 7.4 "INSURANCE AND BONDS" is hereby deleted in its entirety.

ARTICLE 7.5 "RESTORING SURFACES OPENED BY PERMISSION." The third sentence of the first paragraph is hereby revised to read as follows:

Payment for repair of surfaces opened by permission will be made in accordance with Article 41. "Changes and Alterations" of "Special Provisions for Construction".

SPECIAL PROVISION TO TXDOT ITEM 8

PROSECUTION AND PROGRESS

For this project, Item 8 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 8.1 "PROSECUTION OF WORK" The third sentence in the first paragraph is hereby revised to read as follows:

"The Contractor shall begin the work to be performed under the contract within ten (10) days after the date of the authorization to begin work as shown on the work order.

ARTICLE 8.2 "PROGRESS SCHEDULES", B. "CONSTRUCTION CONTRACTS" The first sentence in the first paragraph is hereby revised to read as follows:

If required by the Engineer, before starting work on a construction Contract, prepare and submit a progress schedule based on the sequence of work and traffic control plan shown in the Contract.

SPECIAL PROVISION TO TXDOT ITEM 9

MEASUREMENT AND PAYMENT

For this project, Item 9 of the Texas Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 9.2 "PLANS QUANTITY MEASUREMENT" is hereby revised to read as follows: Plans quantities may not represent the exact quantity of work performed or material moved, handled, or placed during the execution of the Contract. The estimated bid quantities are designated as final payment quantities.

ARTICLE 9.4 "PAYMENT FOR EXTRA WORK" is hereby revised to read as follows:

Extra work ordered, performed and accepted will be paid for in accordance with ARTICLE 42, "EXTRA WORK" of "Special Provisions for Construction".

ARTICLE 9.5 "FORCE ACCOUNT" is hereby deleted in its entirety.

ARTICLE 9.6 "PROGRESS PAYMENTS" is hereby deleted in its entirety and replaced by ARTICLE 36, "PROGRESS PAYMENTS AND RETAINAGE" of Section IV, "General Terms and Conditions".

ARTICLE 9.8 "FINAL PAYMENT" and ARTICLE 40, "FINAL PAYMENT" are hereby deleted in their entirety and replaced by ARTICLE 6(b), "PAYMENTS TO CONTACTOR, FINAL PAYMENT" of "Special Provisions for Construction".

SPECIAL PROVISION TO HC ITEM 1

"DEFINITION OF TERMS"

For this project, Item 1 of the Harris County General Conditions is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby:

THE TERM "DEPARTMENT," "HARRIS COUNTY," "HARRIS COUNTY ENGINEERING DEPARTMENT", SHALL, IN THE USE OF THE STANDARD SPECIFICATIONS FOR ALL WORK IN CONNECTION WITH THIS PROJECT, BE DEEMED TO MEAN GALVESTON COUNTY, PARTY OF THE FIRST PART IN ACCOMPANYING CONTRACT OR CONTRACTS. ANY REFERENCE IN THE HARRIS COUNTY STANDARD SPECIFICATIONS TO THE HARRIS COUNTY, ITS OFFICIALS, EMPLOYEES, OR AGENTS SHALL BE DEEMED TO MEAN GALVESTON COUNTY, ITS OFFICIALS, EMPLOYEES, OR AGENTS.

Article 1.19, "ENGINEER", is revised to read in its entirety as follows:

1.19 ENGINEER. Galveston County Engineer or his authorized representatives. If a representative is authorized to function as the ENGINEER'S representative with respect to certain ENGINEER'S activities that representative's responsibilities and obligations shall be limited as provided in Article 1.36.

Article 1.20, "INSPECTOR," is revised to read in its entirety as follows:

1.20 INSPECTOR. The representative of the ENGINEER assigned and authorized to observe or inspect any or all parts of the work and the material to be used therein. A representative is authorized to function as the ENGINEER'S representative with respect to certain activities, and that representative's responsibilities and obligations shall be limited as provided in Article 1.36.

Special Provisions to HC Item 1

"DEFINITION OF TERMS"

ADDITIONAL ARTICLES ARE ADDED AS FOLLOWS:

1.36 CONSULTING ENGINEER. Independent engineering firms contracting with Galveston County for the providing of professional engineering services. The engineering firms are the representatives of Galveston County only to the extent provided in the Contract documents and in such special instances where they are specifically authorized by Galveston County so to act. All powers and rights assigned by Galveston County to the engineering firms with respect to the work are solely and exclusively for the benefit of Galveston County and not for the CONTRACTOR. In carrying out of its powers and rights assigned by Galveston County the engineering firms shall function as a representative of Galveston County and shall act by and for Galveston County. Irrespective of what authority may be assigned by Galveston County to the engineering firms, CONTRACTOR remains fully and solely responsible and liable for its obligations to perform the work in accordance with the requirements of the plans and specifications; to insure against failures in safety precautions; to carry out his work pursuant to safe methods of construction; to select and fulfill the proper manner, means, and methods in performing the work in order to meet the plans and specifications; and to complete the work in accordance with the contract documents.

SPECIAL CITY OF HOUSTON ITEM 01270

MEASUREMENT AND PAYMENT

For this project, Item 01270 of the City of Houston Standard Specifications is hereby amended with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

ARTICLE 1.03 "UNIT QUANTITIES SPECIFIED" is hereby deleted in its entirety.

ARTICLE 1.04 "MEASUREMENT OF QUANTITIES" is hereby revised to read as follows: Plans quantities may not represent the exact quantity of work performed or material moved, handled, or placed during the execution of the Contract. The estimated bid quantities are designated as final payment quantities.

ARTICLE 1.05B is hereby revised to read as follows:

Total compensation for required Unit Price work shall be included in Unit Price bid in Document Bid Proposal Form. Claims for payment as Unit Price work, but not specifically covered in the list of Unit Prices contained in Document Bid Proposal, will not be accepted.

ARTICLE 1.05C is hereby deleted in its entirety.

ARTICLE 1.06 "NONCONFORMANCE ASSESSMENT" hereby revised to read as follows:

A. Remove and replace work, or portions of the Work, not conforming to the Contract documents.

B. When not practical to remove and replace work, County Engineer will direct one of the following remedies:

1. Nonconforming work will remain as is, but Unit Price will be adjusted lower at discretion of County Engineer.

2. Nonconforming work will be modified as authorized by County Engineer, and the Unit Price will be adjusted lower at the discretion of County Engineer, when modified work is deemed less suitable than specified.

C. Specification sections may modify the above remedies or may identify a specific formula or percentage price reduction.

D. Authority of County Engineer to assess nonconforming work and identify payment adjustment is final.