Control	**0172-01-055, ETC.**
Project	**F 2025(292), ETC.**
Highway	**BU 287P**
County	**TARRANT**

ADDENDUM ACKNOWLEDGMENT

Each bidder is required to acknowledge receipt of an addendum issued for a specific project. This page is provided for the purpose of acknowledging an addendum.

FAILURE TO ACKNOWLEDGE RECEIPT OF AN ADDENDUM WILL RESULT IN THE BID NOT BEING READ.

In order to properly acknowledge an addendum place a mark in the box next to the respective addendum.

ADDENDUM NO. 1 ☐

ADDENDUM NO. 2 ☐

ADDENDUM NO. 3 ☐

ADDENDUM NO. 4 ☐

ADDENDUM NO. 5 ☐

In addition, the bidder by affixing their signature to the signature page of the proposal is acknowledging that they have taken the addendum(s) into consideration when preparing their bid and that the information contained in the addendum will be included in the contract, if awarded by the Commission or other designees.

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Control	**0172-01-055, ETC.**
Project	**F 2025(292), ETC.**
Highway	**BU 287P**
County	**TARRANT**

PROPOSAL TO THE TEXAS TRANSPORTATION COMMISSION

2024 SPECIFICATIONS

WORK CONSISTING OF PREVENTIVE MAINTENANCE

TARRANT COUNTY, TEXAS

The quantities in the proposal are approximate. The quantities of work and materials may be increased or decreased as considered necessary to complete the work as planned and contemplated.

This project is to be completed in 192 working days and will be accepted when fully completed and finished to the satisfaction of the Executive Director or designee.

Provide a proposal guaranty in the form of a Cashier's Check, Teller's Check (including an Official Check) or Bank Money Order on a State or National Bank or Savings and Loan Association, or State or Federally chartered Credit Union made payable to the Texas Transportation Commission in the following amount:

ONE HUNDRED THOUSAND (Dollars) **($100,000)**

A bid bond may be used as the required proposal guaranty. The bond form may be detached from the proposal for completion. The proposal may not be disassembled to remove the bond form. The bond must be in accordance with Item 2 of the specifications.

Any addenda issued amending this proposal and/or the plans that have been acknowledged by the bidder, become part of this proposal.

By signing the proposal the bidder certifies:

1. the only persons or parties interested in this proposal are those named and the bidder has not directly or indirectly participated in collusion, entered into an agreement or otherwise taken any action in restraint of free competitive bidding in connection with the above captioned project.
2. in the event of the award of a contract, the organization represented will secure bonds for the full amount of the contract.
3. the signatory represents and warrants that they are an authorized signatory for the organization for which the bid is submitted and they have full and complete authority to submit this bid on behalf of their firm.
4. that the certifications and representations contained in the proposal are true and accurate and the bidder intends the proposal to be taken as a genuine government record.

- **Signed: ****

(1) _____ (2) _____ (3) _____

Print Name:

(1) _____ (2) _____ (3) _____

Title:

(1) _____ (2) _____ (3) _____

Company:

(1) _____ (2) _____ (3) _____

- Signatures to comply with Item 2 of the specifications.

**Note: Complete (1) for single venture, through (2) for joint venture and through (3) for triple venture.

*** When the working days field contains an asterisk (*) refer to the Special Provisions and General Notes.**

NOTICE TO CONTRACTORS

ANY CONTRACTORS INTENDING TO BID ON ANY WORK TO BE AWARDED BY THIS DEPARTMENT MUST SUBMIT A SATISFACTORY "AUDITED FINANCIAL STATEMENT" AND "EXPERIENCE QUESTIONNAIRE" AT LEAST TEN DAYS PRIOR TO THE LETTING DATE.

UNIT PRICES MUST BE SUBMITTED IN ACCORDANCE WITH ITEM 2 OF THE STANDARD SPECIFICATIONS OR SPECIAL PROVISION TO ITEM 2 FOR EACH ITEM LISTED IN THIS PROPOSAL.

TEXAS DEPARTMENT OF TRANSPORTATION

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS,

That we, (Contractor Name) _____

_____

Hereinafter called the Principal, and (Surety Name) _____

_____

a corporation or firm duly authorized to transact surety business in the State of Texas, hereinafter called the Surety, are held and firmly bound unto the Texas Department of Transportation, hereinafter called the Obligee, in the sum of not less than two percent (2%) of the department's engineer's estimate, rounded to the nearest one thousand dollars, not to exceed one hundred thousand dollars ($100,000) as a proposal guaranty (amount displayed on the cover of the proposal), the payment of which sum will and truly be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the principal has submitted a bid for the following project identified as:

Control	**0172-01-055, ETC.**
Project	**F 2025(292), ETC.**
Highway	**BU 287P**
County	**TARRANT**

NOW, THEREFORE, if the Obligee shall award the Contract to the Principal and the Principal shall enter into the Contract in writing with the Obligee in accordance with the terms of such bid, then this bond shall be null and void. If in the event of failure of the Principal to execute such Contract in accordance with the terms of such bid, this bond shall become the property of the Obligee, without recourse of the Principal and/or Surety, not as a penalty but as liquidated damages.

Signed this _____ Day of _____ 20_____

By: _____

(Contractor/Principal Name)

_____

(Signature and Title of Authorized Signatory for Contractor/Principal)

*By: _____

(Surety Name)

_____

(Signature of Attorney-in-Fact)

*Attach Power of attorney (Surety) for Attorney-in-Fact

Impressed Surety Seal Only

This form may be removed from the proposal.

C U T H E R E

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BIDDER'S CHECK RETURN

IMPORTANT

The space provided for the return address must be completed to facilitate the return of your bidder's check. Care must be taken to provide a legible, accurate, and complete return address, including zip code. A copy of this sheet should be used for each different return address.

NOTE

Successful bidders will receive their guaranty checks with the executed contract.

RETURN BIDDERS CHECK TO (PLEASE PRINT):

Control	**0172-01-055, ETC.**
Project	**F 2025(292), ETC.**
Highway	**BU 287P**
County	**TARRANT**

IMPORTANT

PLEASE RETURN THIS SHEET IN ITS ENTIRETY

Please acknowledge receipt of this check(s) at your earliest convenience by signing below in longhand, in ink, and returning this acknowledgement in the enclosed self addressed envelope.

Check Received By: _____ Date:_____

Title: _____

For (Contractor's Name): _____

Project _____ County_____

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NOTICE TO THE BIDDER

In the space provided below, please enter your total bid amount for this project. Only this figure will be read publicly by the Department at the public bid opening.

It is understood and agreed by the bidder in signing this proposal that the total bid amount entered below is not binding on either the bidder or the Department. It is further agreed that **the official total bid amount for this proposal will be determined by multiplying the unit bid prices for each pay item by the respective estimated quantities shown in this proposal and then totaling all of the extended amounts.**

$_____

Total Bid Amount

Control 0001-03-030
Project STP 2000(938)HES
Highway SH 20
County EL PASO

ALT	ITEM	DESC	SP	Bid Item Description	Unit	Quantity	Bid Price	Amount	Seq
	104	509		REMOV CONC (SDWLK)	SY	266.400	$10.000	$2,664.00	1

EXAMPLE

Total Bid Amount _____$2,664.00_____

Signed _____
Title _____
Date _____

Additional Signature for Joint Venture:

Signed _____
Title _____
Date _____

EXAMPLE OF BID PRICES SUBMITTED BY COMPUTER PRINTOUT

EXAMPLES

BID PRICES SUBMITTED BY HAND WRITTEN FORMAT

ALT	ITEM-CODE			UNIT BID PRICE ONLY WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC NO	S.P. NO.				
	190	026		RED OAK 1 1/2 - 1 3/4 GAL BB	EA	9.000	1
				EXAMPLE: One hundred fifty DLRS and No CENTS			

Unit price for each plant in place

	249	014		FLEX BASE(DEL)(DENSCOT)(TY A GR4 CL2)	TON	56,787.00	14
				EXAMPLE: Seven DLRS and Fifty three CENTS			

Unit price for each ton of Flexible Base

	430	001	001	CL A CONC FOR EXT STR (CULV)	CY	45.000	27
				EXAMPLE: Three hundred five DLRS and No CENTS			

Unit price for each cubic yard of Concrete

	610	007	001	RDWY ILL ASSEM(TY ST 50T-8-8)(.4 KW)S	EA	13.000	7
				EXAMPLE: Fourteen hundred sixteen DLRS and Thirty seven CENTS			

Unit price of each Roadway Illumination Assembly

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ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	100	7004		PREP ROW (TREE REMOVE) (12"-24" DIA) DOLLARS and CENTS	EA	1.000	1
	104	7011		REMOV CONC (DRIVEWAYS) DOLLARS and CENTS	SY	433.000	2
	104	7013		REMOV CONC (SIDEWALK, RAMP OR SUP) DOLLARS and CENTS	SY	58.000	3
	104	7016		REMOV CONC (CURB) DOLLARS and CENTS	LF	1,882.000	4
	104	7018		REMOV CONC (CURB OR CURB & GUTTER) DOLLARS and CENTS	LF	2,211.000	5
	105	7002		RMV (2"-6") TRT/UNTRT BASE & ASPH PAV DOLLARS and CENTS	SY	147.000	6
	105	7111		RMV (0"-12") TRT/UNTRT BASE & ASPH PAV DOLLARS and CENTS	CY	7,897.000	7
	110	7003		EXCAV (SPECIAL) DOLLARS and CENTS	CY	900.000	8
	132	7001		EMBANK (FNL)(OC)(TY A) DOLLARS and CENTS	CY	1,000.000	9
	132	7005		EMBANK (FNL)(OC)(TY C) DOLLARS and CENTS	CY	1,500.000	10
	134	7002		BACKFILL (TY B) DOLLARS and CENTS	STA	48.000	11
	161	7002		COMPOST MANUF TOPSOIL (4") DOLLARS and CENTS	SY	7,729.000	12

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	162	7002		BLOCK SODDING DOLLARS and CENTS	SY	7,729.000	13
	168	7001		VEGETATIVE WATERING DOLLARS and CENTS	TGL	271.000	14
	316	7006		ASPH (AC-20XP) DOLLARS and CENTS	GAL	53,643.000	15
	316	7214		AGGR (TY-PB, GR-5)(SAC-B) DOLLARS and CENTS	CY	1,441.000	16
	341	7044		D-GR HMA TY-D SAC-A PG64-22 DOLLARS and CENTS	TON	131.000	17
	344	7024		SP MIXES SP-C SAC-A PG70-28 DOLLARS and CENTS	TON	24,682.000	18
	351	7004		FLEXIBLE PAVEMENT STRUCTURE REPAIR(5") DOLLARS and CENTS	SY	4,000.000	19
	354	7003		PLANE & TEXT ASPH CONC PAV(0" TO 3") DOLLARS and CENTS	SY	214,532.000	20
	361	7005		FULL - DEPTH REPAIR CRCP (10") DOLLARS and CENTS	CY	1,500.000	21
	402	7001		TRENCH EXCAVATION PROTECTION DOLLARS and CENTS	LF	846.000	22
	403	7001		TEMPORARY SPL SHORING DOLLARS and CENTS	SF	1,335.000	23
	423	7015		RETAINING WALL (SPREAD FOOTING) DOLLARS and CENTS	SF	5,370.000	24

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	432	7002		RIPRAP (CONC)(5 IN) DOLLARS and CENTS	CY	30.000	25
	432	7012		RIPRAP (CONC)(FLUME) DOLLARS and CENTS	CY	1.000	26
	432	7029		RIPRAP (STONE COMMON)(DRY)(6 IN) DOLLARS and CENTS	CY	83.000	27
	438	7007		CLEANING AND SEALING EXIST JOINTS (CL7) DOLLARS and CENTS	LF	468.000	28
	450	7059		RAIL (HANDRAIL)(TY B) DOLLARS and CENTS	LF	1,321.000	29
	454	7009		HEADER TYPE EXPANSION JOINT DOLLARS and CENTS	CF	65.000	30
	464	7005		RC PIPE (CL III)(24 IN) DOLLARS and CENTS	LF	775.000	31
	464	7009		RC PIPE (CL III)(36 IN) DOLLARS and CENTS	LF	24.000	32
	465	7186		INLET (COMPL)(CO)(15 FT)(FTW) DOLLARS and CENTS	EA	2.000	33
	465	7187		INLET (COMPL)(CO)(20 FT)(FTW) DOLLARS and CENTS	EA	1.000	34
	471	7003		GRATE & FRAME DOLLARS and CENTS	EA	100.000	35
	479	7001		ADJUSTING MANHOLES DOLLARS and CENTS	EA	28.000	36

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	500	7001		MOBILIZATION DOLLARS and CENTS	LS	1.000	37
	502	7001		BARRICADES, SIGNS AND TRAFFIC HANDLING DOLLARS and CENTS	MO	9.000	38
	503	7002		PORTABLE CHANGEABLE MESSAGE SIGN DOLLARS and CENTS	EA	2.000	39
	505	7001		TMA (STATIONARY) DOLLARS and CENTS	DAY	283.000	40
	505	7003		TMA (MOBILE OPERATION) DOLLARS and CENTS	DAY	79.000	41
	506	7039		TEMP SEDMT CONT FENCE (INSTALL) DOLLARS and CENTS	LF	9,393.000	42
	506	7041		TEMP SEDMT CONT FENCE (REMOVE) DOLLARS and CENTS	LF	9,393.000	43
	506	7043		BIODEG EROSN CONT LOGS (INSTL) (8") DOLLARS and CENTS	LF	1,500.000	44
	506	7046		BIODEG EROSN CONT LOGS (REMOVE) DOLLARS and CENTS	LF	1,500.000	45
	512	7009		PORT CTB (FUR & INST)(LOW PROF)(TY 1) DOLLARS and CENTS	LF	1,360.000	46
	512	7010		PORT CTB (FUR & INST)(LOW PROF)(TY 2) DOLLARS and CENTS	LF	120.000	47
	512	7033		PORT CTB (MOVE)(LOW PROF)(TY 1) DOLLARS and CENTS	LF	1,360.000	48

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	512	7034		PORT CTB (MOVE)(LOW PROF)(TY 2) DOLLARS and CENTS	LF	120.000	49
	512	7057		PORT CTB (REMOVE)(LOW PROF)(TY 1) DOLLARS and CENTS	LF	1,360.000	50
	512	7058		PORT CTB (REMOVE)(LOW PROF)(TY 2) DOLLARS and CENTS	LF	120.000	51
	529	7002		CONC CURB (TY II) DOLLARS and CENTS	LF	1,882.000	52
	529	7007		CONC CURB (MONO) (TY II) DOLLARS and CENTS	LF	22.000	53
	529	7009		CONC CURB & GUTTER (TY II) DOLLARS and CENTS	LF	9,389.000	54
	529	7014		CONC CURB (DOWEL) DOLLARS and CENTS	LF	55.000	55
	529	7018		CONC CURB & GUTTER (ARMOR CURB) DOLLARS and CENTS	LF	462.000	56
	530	7006		DRIVEWAYS (CONC) DOLLARS and CENTS	SY	795.000	57
	531	7001		CONC SIDEWALKS (4") DOLLARS and CENTS	SY	5,903.000	58
	531	7015		CURB RAMPS (TY 1) DOLLARS and CENTS	SY	77.000	59
	531	7016		CURB RAMPS (TY 2) DOLLARS and CENTS	SY	94.000	60

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	531	7017		CURB RAMPS (TY 3) DOLLARS and CENTS	SY	14.000	61
	531	7020		CURB RAMPS (TY 7) DOLLARS and CENTS	SY	84.000	62
	531	7021		CURB RAMPS (TY 10) DOLLARS and CENTS	SY	62.000	63
	531	7025		CONC SIDEWALKS (SPECIAL) DOLLARS and CENTS	SY	298.000	64
	556	7006		PIPE UNDERDRAINS (TY 6) (6") DOLLARS and CENTS	LF	1,306.000	65
	624	7008		GROUND BOX TY D (162922)W/APRON DOLLARS and CENTS	EA	1.000	66
	644	7001		IN SM RD SN SUP&AM TY10BWG(1)SA(P) DOLLARS and CENTS	EA	8.000	67
	644	7028		IN SM RD SN SUP&AM TYS80(1)SA(T) DOLLARS and CENTS	EA	2.000	68
	644	7073		REMOVE SM RD SN SUP&AM DOLLARS and CENTS	EA	10.000	69
	658	7066		INSTL OM ASSM (OM-3L)(TWT)GND DOLLARS and CENTS	EA	1.000	70
	658	7078		REMOVE DELIN & OBJECT MARKER ASSMS DOLLARS and CENTS	EA	1.000	71
	662	7005		WK ZN PAV MRK NON-REMOV (W)6"(BRK) DOLLARS and CENTS	LF	26,970.000	72

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	662	7006		WK ZN PAV MRK NON-REMOV (W)6"(DOT) DOLLARS and CENTS	LF	470.000	73
	662	7008		WK ZN PAV MRK NON-REMOV (W)6"(SLD) DOLLARS and CENTS	LF	102,372.000	74
	662	7012		WK ZN PAV MRK NON-REMOV (W)8"(SLD) DOLLARS and CENTS	LF	11,738.000	75
	662	7015		WK ZN PAV MRK NON-REMOV (W)12"(SLD) DOLLARS and CENTS	LF	500.000	76
	662	7017		WK ZN PAV MRK NON-REMOV (W)24"(SLD) DOLLARS and CENTS	LF	7,428.000	77
	662	7018		WK ZN PAV MRK NON-REMOV (W)(ARROW) DOLLARS and CENTS	EA	116.000	78
	662	7030		WK ZN PAV MRK NON-REMOV(W)(WORD) DOLLARS and CENTS	EA	112.000	79
	662	7038		WK ZN PAV MRK NON-REMOV (Y)6"(SLD) DOLLARS and CENTS	LF	189,582.000	80
	662	7049		WK ZN PAV MRK REMOV (REFL) TY I-C DOLLARS and CENTS	EA	2,140.000	81
	662	7051		WK ZN PAV MRK REMOV (REFL) TY II-A-A DOLLARS and CENTS	EA	3,026.000	82
	666	7009		REFL PAV MRK TY I (W)6"(DOT)(100MIL) DOLLARS and CENTS	LF	235.000	83
	666	7024		REFL PAV MRK TY I (W)8"(SLD)(100MIL) DOLLARS and CENTS	LF	5,869.000	84

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	666	7030		REFL PAV MRK TY I (W)12"(SLD)(100MIL) DOLLARS and CENTS	LF	250.000	85
	666	7036		REFL PAV MRK TY I (W)24"(SLD)(100MIL) DOLLARS and CENTS	LF	3,714.000	86
	666	7042		REFL PAV MRK TY I (W)(ARROW)(100MIL) DOLLARS and CENTS	EA	58.000	87
	666	7066		REFL PAV MRK TY I (W)(WORD)(100MIL) DOLLARS and CENTS	EA	56.000	88
	666	7408		REFL PAV MRK TY I (W)6"(BRK)(100MIL) DOLLARS and CENTS	LF	13,485.000	89
	666	7411		REFL PAV MRK TY I (W)6"(SLD)(100MIL) DOLLARS and CENTS	LF	51,186.000	90
	666	7423		REFL PAV MRK TY I (Y)6"(SLD)(100MIL) DOLLARS and CENTS	LF	94,791.000	91
	672	7002		REFL PAV MRKR TY I-C DOLLARS and CENTS	EA	970.000	92
	672	7004		REFL PAV MRKR TY II-A-A DOLLARS and CENTS	EA	1,513.000	93
	690	7100		REMOVE TRAFFIC SIGNAL DOLLARS and CENTS	EA	1.000	94
	764	7001		DRAIN INLET CLEANING DOLLARS and CENTS	EA	42.000	95
	3010	7001		RAIS AND UNDERSEAL CONC SLBS W FOAM SYS DOLLARS and CENTS	LB	61,365.000	96

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	6017	7001		VDS PROSR SYS DOLLARS and CENTS	EA	1.000	97
	6017	7010		VDS ATSPM DOLLARS and CENTS	EA	1.000	98
	6017	7012		VDS CABLING DOLLARS and CENTS	LF	950.000	99
	6017	7014		VDS (HVDS) (VIVDS AND RVDS) DOLLARS and CENTS	EA	3.000	100
	6040	7001		HIGHWAY TRAFFIC SIGNALS (COFW) DOLLARS and CENTS	EA	1.000	101

CERTIFICATION OF INTEREST IN OTHER BID PROPOSALS FOR THIS WORK

By signing this proposal, the bidding firm and the signer certify that the following information, as indicated by checking “Yes” or “No” below, is true, accurate, and complete.

A. Quotation(s) have been issued in this firm's name to other firm(s) interested in this work for consideration for performing a portion of this work.

_____ YES

_____ NO

B. If this proposal is the low bid, the bidder agrees to provide the following information prior to award of the contract.

1. Identify firms which bid as a prime contractor and from which the bidder received quotations for work on this project.
2. Identify all the firms which bid as a prime contractor to which the bidder gave quotations for work on this project.

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352 (See reverse for public burden disclosure.)

1. Type of Federal Action: a. contract b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	2. Status of Federal Action: a. bid/offer/application b. initial award c. post-award	3. Report Type: a. initial filing b. grant For material change only: year _____ quarter _____ date of last report _____

4. **Name and Address of Reporting Entity:** ? Prime ? Subawardee Tier _____, if known: **Congressional District**, if known:	5. **If Reporting Entity in No. 4 is Subawardee,** Enter Name and Address of Prime: **Congressional District**, if known:
6. **Federal Department/Agency:**	7. **Federal Program Name/Description:** CFDA Number, if applicable: _____
8. **Federal Action Number**, if known:	9. **Award Amount,** if known: $ _____
10. a. Name and Address of Lobbying Entity (if individual, last name, first name, MI):	b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI):

(attach Continuation Sheet(s) SF-LLL-A, if necessary)

11. Amount of Payment (check all that apply): $ _____ actual planned 12. Form of Payment (check all that apply) a. cash b. in-kind; specify: nature _____ value _____	13. Type of Payment (check all that apply): a. retainer b. one-time fee c. commission d. contingent fee e. deferred f. other; specify: _____

14. Brief Description of Services Performed or to be Performed and Date(s) of Service, including officer(s), employee(s), or Member(s) contacted, for Payment Indicated in Item 11:

(attach Continuation Sheet(s) SF-LLL-A, if necessary)

15. **Continuation Sheet(s) SF-LLL-A attached:** ? Yes ? No

16. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No: _____ Date: _____

FEDERAL USE ONLY	Authorized for Local Reproduction Standard Form - LLL

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity 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 a covered Federal action. Use the SF-LLL-A Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity or this covered Federal action.
4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee", then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number, the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.
    (b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.
14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.
15. Check whether or not a SF-LLL-A Continuation Sheet(s) is attached.
16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB

0348-0046

CONTINUATION SHEET

Reporting Entity: _____ Page _____ of _____

CONTRACTOR'S ASSURANCE

(Subcontracts-Federal Aid Projects)

By signing this proposal, the contractor is giving assurances that all subcontract agreements will incorporate the Standard Specification and Special Provisions to Section 9.9., Payment Provisions for Subcontractors, all subcontract agreements exceeding $2,000 will incorporate the applicable Wage Determination Decision, and all subcontract agreements will incorporate the following:

Special Provision	Certification of Nondiscrimination in Employment
Special Provision	Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)
Special Provision	Standard Federal Equal Employment Opportunity
Construction	Construction Specifications (Executive Order 11246)
Form FHWA 1273	Required Contract Provisions Federal-aid Construction Contracts (Form FHWA 1273 must also be physically attached to subcontracts and all lower-tier subcontracts)
Special Provision	Nondiscrimination (Include provisions of Sections 3.1 – 3.6 in all subcontracts and agreements for materials)
Special Provision	Cargo Preference Act Requirements in Federal-Aid Contracts
Special Provision	Disadvantaged Business Enterprise in Federal-Aid Contracts

ENGINEER SEAL

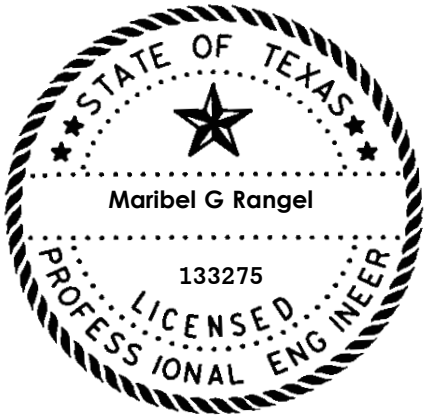
Control **0172-01-055, ETC.**

Project **F 2025(292), ETC.**

Highway **BU 287P**

County **TARRANT**

The enclosed Texas Department of Transportation Specifications, Special Specifications, Special Provisions, General Notes and Specification Data in this document have been selected by me, or under my responsible supervision as being applicable to this project. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.



The seal appearing on this document was authorized by

Maribel G Rangel, P.E.

SEPTEMBER 13, 2024

Specification Data

Basis of Estimate

Item	Description	Rate	Unit
168	Vegetative Watering	169,400 gal./acre	1,000 gal.
341	D-GR HMA TY D	115 lb./sq. yd.-in.	ton
344	SP MIXES SP-C	115 lb./sq. yd.-in.	ton

Seal Coat Data

Modified Asphalts (Roadway)

Asph Type AC-20XP
Rate 0.25 gal./sq. yd. (when using Gr. 5 aggregate)(2nd Course)

Aggr Type PB
Rate 1 cu. yd./150 sq. yd. (Gr. 5)

Note: The rates of asphalt and aggregate application are for estimating purposes only and may be varied as directed.

Special Notes

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer.

The data located in these files is for non-construction purposes only and can be found at

TxDOT's public FTP site at https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/.

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site:

County: Tarrant

Highway: BU 287P

http://www.txdot.gov/business/letting-bids/plans-online.html

Contractor questions on this project are to be addressed to the following individual(s):

Area Engineer's Email: maribel.rangel@txdot.gov
Assistant Area Engineer's Email: justin.thomey@txdot.gov
Design Manager's Email: raul.orozco@txdot.gov

For Q&A's on Proposals navigate to https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors. Use the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

Peak Hours		Off-Peak Hours	
6 to 9 AM Monday through Friday	3 to 7 PM Monday through Friday	9 AM to 3 PM and 7 PM to 6 AM Monday through Friday	All day Saturday and Sunday

Work that requires closure of multiple travel lanes in the same direction, except as otherwise shown in the plans, are restricted to night hours between 9 PM and 6 AM.
Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

For dimensions of right-of-way not shown on the plans, see right-of-way map on file at the TxDOT District Office.

Modifications to Lane Closure / Work Restrictions:

Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

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When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Special Events/ Special Situations will be handled on a case-by-case basis. No work restricting lane closures is allowed from 3 PM a day before to 9 AM the day after the Special Event or Special Situation.

Complete all work in these easement areas prior to the expiration dates shown. In the event that work is done after these expiration dates, all costs for extending these dates will be paid by the Contractor.

Remove all existing fences within the right of way and remove and replace all existing fences within easements where such fences conflict with the work. Protect the remaining fence from damage due to slacking. Erect temporary fencing in the easement areas as necessary to secure the property. Provide at least one week notice to the property owner prior to removing or relocating the fence. Restore permanent fencing to an equal or better condition.

Provide all-weather surface for temporary ingress and egress to adjacent property, as directed. Materials, labor, equipment and incidentals necessary to provide temporary ingress and egress will not be paid for directly, but will be subsidiary to the various bid items.

Where necessary, the governing slopes indicated herein may be varied from the limits shown, to the extent approved.

On superelevated curves the shoulders will have the same cross-slope as the pavement, unless otherwise indicated.

On superelevated curves where the grade line is in a sag or on a flat grade, overlay the shoulders to the extent necessary to prevent trapping of water on the high side.

All driveway openings will be determined by the Engineer and will conform with Texas Department of Transportation "Regulations for Access Driveways to State Highways" adopted September 1953, and revised June 2004.

Locations and lengths of all private entrances are approximate only. The actual locations, lengths, lines and grades are to be determined by the Engineer and shall conform to the regulations of The City of City of Fort Worth and The City of Forest Hill.

Do not discolor or damage existing curb and curb and gutter during construction operations. In the event of discoloration or damage, clean or repair as directed.

Remove the grass from the crown of shoulders or pavement edges by blading or other approved methods. Payment for this work will not be made directly, but will be subsidiary to the various items of the contract.

Locations shown for drainage structures refer to the control points of structures as follows:

1) Manholes, Inlets, and Junction Boxes—Locations are at the centroid of the structure; when two structure types are specified, location is at the centroid of the top structure. Bottom structure may be positioned as required to align with top structure, storm drain pipes and other adjacent structures.

2) Street Inlets—Locations are at the face of curb at a distance of L/2 from the end of the inlet.

3) Headwalls—Locations are to the outside face of the headwall at the centerline of the pipe or box structure. For pipe headwalls with Type "P" or "C" safety end treatment, locations are on the centerline of the pipe structure at the limit of payment for pipe.

Plugging of pipes or culverts will not be paid for directly, but will be subsidiary to the various bid items, unless otherwise shown on the plans.

Provide temporary drain openings at all low points or other drainage structures, as required, at the Contractor's expense.

Remove any obstructions to existing drainage due to the contractor's operations, as required, at the Contractor's expense.

Install all required concrete riprap flumes immediately following the construction of ditches in which they are to be placed. In addition, apply all erosion control measures as shown on the plans or as directed, immediately following construction of channels to their required line, grade, and section.

Item 4. Scope of Work

Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

Item 5. Control of the Work

When supplementary bridge plans, shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 17 by 22 inches, or full size drawings reduced to half scale if completely

legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2 inch left margin, and 1/2 inch top, right, and bottom margins.

Submit all sheets with a title in the lower right hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

Item 6. Control of Materials

The Buy America Material Classification Sheet is located at the below link.
https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7. Legal Relations and Responsibilities

This contract requires work to be done on railroad property. Cooperate with the railroads and comply with all of their requirements including obtaining any required training before performing work on railroad property.
Submit to the Engineer an original railroad liability insurance policy.

Do not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (USACE) permit area that has not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to haul roads, equipment staging areas, borrow and disposal sites. “Associated” as defined here means materials are delivered to or from the PSL. The permit area includes all waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. The contractor will be responsible for all consultations with the USACE regarding activities, including project specific locations (PSLs) that have not been previously evaluated by the USACE. Provide the Department with a copy of all consultations or approvals from the USACE prior to initiating activities.

The Contractor may proceed with activities in PSLs that do not affect a USACE permit area if a self-determination has been made that the PSL is non-jurisdictional or proper USACE clearances have been obtained in jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. The contractor is solely responsible for documenting any determinations that their activities do not affect a USACE permit area. Maintain copies of these determinations for review by the Department or any regulatory agency.

Document and coordinate with the USACE, if required, prior to any excavation hauled from or embankment hauled into a USACE permit area by either (1) or (2) below.

(1) Restricted Use of Materials for Previously Evaluated Permit Areas. Document both the project specific location (PSL) and its authorization. Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:

a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in Item 110 is used for permanent or temporary fill (Item 132, Embankment) within a USACE permit area;
b. Suitable embankment (Item 132) from within the USACE permit area is used as fill within a USACE evaluated area; and,
c. Unsuitable excavation or excess excavation ["Waste"] (Item 110) that is disposed of at a location approved by the Engineer within a USACE evaluated area.

(2) Contractor Materials from Areas Other than Previously Evaluated Areas. Provide the Department with a copy of all USACE coordination or approvals prior to initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to haul roads, equipment staging areas, borrow and disposal sites:

a. Item 132, Embankment, used for temporary or permanent fill within a USACE permit area; and,
b. Unsuitable excavation or excess excavation ["Waste"] (Item 110, Excavation) that is disposed of outside a USACE evaluated area.

The total area disturbed for this project is 3.51 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges and all railroad tracks encountered as approved. Clean and repair all of these features if they weren't properly protected at contractor's expense. This work is subsidiary work to applicable bid items.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction

operations outside of the preferred nesting season. Otherwise, avoid nests containing migratory birds and perform no work in the nesting areas until the young birds have fledged.

Structures

Do not begin bridge and culvert construction operations until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

The following Holiday/Event lane closure restriction requirements apply to this project:
No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2
Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday

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Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

Event Lane Closure Restrictions 3 PM the day before Event to 9 AM the day after the Event			
NASCAR Races at Texas Motor Speedway (generally 3 events):	NASCAR Nationwide and Sprint Cup Series (Held in late March/early April)	NASCAR Nationwide and Sprint Cup Series (Held in Late October/early November)	Indy Series Racing and NASCAR Truck Series (Held in June)
Within one mile radius of major retail traffic generators i.e. malls (Thanksgiving Day through January 2)			
Fort Worth Stock Show and Rodeo			

Item 8. Prosecution and Progress

Each contract awarded by the Department stands on its own, and as such, is separate from other contracts. A Contractor awarded multiple contracts must be capable and sufficiently staffed to concurrently process and/or execute all contracts at the same time.

Working days will be computed and charged in accordance with Section 8.3.1.1, 'Five-Day Workweek.'

The number of working days for final acceptance will be **192** working days.

Only nighttime work will be allowed of the Phase II and Phase III of the TCP, unless otherwise approved by the Engineer.

Use Critical Path Method (CPM) schedule in P6 format for this project. Submit the baseline schedule and obtain approval prior to beginning construction. The baseline schedule working days will be the same as the number of working days established by the Contract. The Estimate will be held if a monthly schedule update is not submitted. Also submit the XER file.

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Daytime Work	*Nighttime Work*
9:00 am – 3:00 pm Monday – Friday	9:00 pm – 6:00 am Sunday – Thursday

Item 8.9 Workers and Equipment

Provide Multi-Directional Lighting Device for nighttime work with the following quality requirements:

- Provide a 2000 watt (minimum) SIROCCO lighting balloon, Airstar lighting or equivalent.
- It is the intent of the MDLD lighting to supplement the Portable Road Light and Power Unit used to illuminate work areas during night work hours.
- Provide MDLD units which can self-inflate and are capable of illuminating approximately 15,000 sq. ft.
- Provide MDLD units of 1.1 meter horizontal diameter and capable of withstanding 60 mph winds when fully inflated and operating.

Provide MDLD units with two (2) 1,000 watt halogen bulbs recommended by the manufacturer.

Item 100. Preparing Right of Way

Measurement for this item will be along the centerline of the project with the limits of measurements as shown on the plans.

Removal of existing concrete pavement will be in accordance with Item 104, "Removing Concrete" except that this work will not be paid for directly, but will be subsidiary to Item 100, "Preparing Right of Way."

Item 104. Removing Concrete

When associated with a structure to be removed, removal of riprap as required, approach slabs, and shoulder drains are to be included in the unit price bid for Item 496, "Removing Structures."

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Item 105. Removing Treated and Untreated Base and Asphalt Pavement

Cement, lime, and/or lime fly-ash treated base material removed on this project will become the property of the Contractor.

Item 110. Excavation

Review proposed waste sites to determine if any site is located in a "Base Floodplain" or "Floodway" as defined by the Federal Emergency Management Agency (FEMA).

If waste material from this project is placed in a base floodplain as defined by FEMA, obtain a permit from the local community responsible for enforcing National Flood Insurance Program (NFIP) regulations. Ensure that the owner of the property receiving the waste has obtained the necessary permit.

Items 110, 112, and 132. Excavation, Subgrade Widening, and Embankment

Sulfate-laden subgrade material that is to be treated with either lime or cement, including material up to one foot outside the proposed treatment limits, is susceptible to sulfate heave. It has been determined that an excessive concentration of sulfate in the soils (>3,000 PPM by dry weight of the soil) exists for given areas of excavation and/or proposed treated subgrade within the project limits.

Moderate sulfate levels are those defined from 3,001 PPM to 7,000 PPM. Treat these soils with lime at the full 150 lb./cu. yd. rate or cement at the full 125 lb./cu. yd. rate. Do not split the rates to ensure complete reaction and mitigation of sulfate heaves. Allow the mixture to mellow for 7 days to provide for complete reaction.

High sulfate levels are not allowed within the treatment and surrounding areas as defined above.

Test soils for soluble sulfates in accordance with Test Method Tex-145 and Tex-146-E.

Treat moderate sulfate or excavate high sulfate areas identified above and other subgrade areas that may be identified during construction as having moderate to high sulfate concentrations to a depth of one foot below and laterally to one foot outside the proposed treatment limits. Treatment of the moderate level material will be paid for under Item 260, "Lime Treatment (Road Mixed)" or Item 275, "Cement Treatment (Road Mixed)." Removal of the high level material will be measured and paid for in accordance with Item 110, "Excavation" and replacement with suitable material will be measured and paid for in accordance with Item 132, "Embankment."

Any excavated sulfate-laden material will be acceptable for use in fill areas. Do not place within previously specified section boundaries of subgrade to be treated with either lime or cement.

Off-Site Borrow Sources. In addition to meeting pertinent specification requirements, test off-site borrow sources for sulfate content. Test soils for soluble sulfates in accordance with Test Method Tex-145 and Tex-146-E and provide documentation that supports compliance with previously stated requirements. The Engineer will perform additional testing for sulfates of this material upon delivery to the project. Only material that is placed within one foot vertically or laterally of subgrade treatment will require testing for sulfates. Remove and replace failing material (sulfate concentrations >7,000 PPM by dry weight).

Item 132. Embankment
Provide Type C embankment material with a Plasticity Index (PI) less than 35.

Furnish test results per Test Procedures Tex-104, 105, and 106-E (PIs), Tex-113 or 114-E (M-D Curves), and Tex-145 and/or Tex-146-E (Sulfates) for each material sample provided by the Engineer. Perform field density tests (Tex-115-E, Part I) at a frequency for each worked section to produce passing results prior to testing by the Engineer per Tex-115-E, Part I. The Engineer will perform separate testing of the material.

When embankment is placed as a bridge header bank, test each lift for compliance with density requirements, near the center of each travel lane at the following locations:

1. At the “beginning of bridge” or “end of bridge” station (if abutment is on retaining wall, location may be adjusted by not more than 5 feet.)
2. At 25-foot intervals for a distance of 150 feet in advance of the “beginning of bridge” station.
3. At 25-foot intervals for a distance of 150 feet after the “end of bridge” station.

Density tests must be conducted by a department-certified independent testing laboratory. Results of tests will be furnished to TxDOT within 24 hours after testing; a final copy of all test reports must be signed and sealed by a Professional Engineer in the State of Texas and furnished within five (5) working days after testing. Areas which do not meet minimum density requirements will be removed, re-compacted, and re-tested for compliance at the contractor’s entire expense. Testing and reporting of test results will not be paid for directly, but will be subsidiary to this item.

Construct embankments for bridge header banks to final subgrade elevation prior to excavation for abutment caps and placement of foundation course at approach slabs. Payment for structural excavation and/or excavation for placement of foundation course will not be paid for directly, but will be subsidiary to the pertinent bid items.

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At all locations where guardrail is shown to flare, widen the embankment as necessary to accommodate the guardrail.

Item 161. Compost

Place approximately 4" of compost manufactured topsoil (CMT) on all cut and fill slopes (except drainage channels where flexible channel liners are indicated), at other locations shown on the plans, or as directed.

Where "blended on-site" CMT is specified, produce the compost manufactured topsoil by incorporating 1" of compost with 3" of furnished topsoil as shown on the plans.

Where "pre-blended" CMT is specified, amend suitable soil material, as directed, with 25% compost, by volume, to produce the compost manufactured topsoil. Place the compost manufactured topsoil in a loose layer approximately 4" thick, as shown on the plans.

Use the processed material from Item 100 as the wood chips to blend with the compost to produce the Erosion Control Compost required for this project. This is considered subsidiary to Item 161.

Item 162. Sodding for Erosion Control

Furnish and place Bermudagrass sod.

Item 168. Vegetative Watering

Furnish and install an approved rain gauge at the project site, as directed. Furnishing and installation of the rain gauge will not be paid for directly, but will be subsidiary to Item 168.

Apply vegetative watering for an establishment period of thirteen weeks following application of seed or installation of sod, at a rate of 1/2 inch of water depth per week (approximately 13,030 gallons per acre). During the first four weeks after seeding, apply water twice per week, on non-consecutive days, each at half the weekly application rate. For the remainder of the establishment period, apply vegetative watering once per week during the months of January through June or September through December, at the weekly application rate; apply watering twice per week, on non-consecutive days during the months of July and August, each at one-half the weekly application rate.

Average weekly rainfall rates for the District are:

January—0.39"	April—0.86"	July—0.48"	October—0.68"
February—0.46"	May—1.00"	August—0.47"	November—0.46"
March—0.48"	June—0.63"	September—0.74"	December—0.37"

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Item 316. Seal Coats

Asphalt storage tanks may be used.

Provide a transverse variance rate of as applicable or as approved by the Engineer. Provide an equal amount of asphaltic material between the wheelpaths as outside the wheelpaths.

Provide a minimum of 3 pneumatic rollers as specified under Article 316.3.3, “Rollers.”

The asphalt application season for this project is May 1 to August 31.

Item 341. Dense-Graded Hot-Mix Asphalt

RAP aggregate must meet the requirements of Table 1.

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the surfaces other than the travel lanes.

No blending, of the material retained on the No. 4 sieve, to meet SAC A will be allowed for surface mixes.

Natural (field) sands are not allowed.

Provide a PG 64-22 asphalt for the base course.

Provide a PG 64-22 asphalt for the concrete underlayment course.

Provide a PG 70-28 asphalt for the surface course and levelup course, if applicable.

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project. A trackless tack can be used in lieu of CSS-1P tack coat or as directed by the Engineer. The Engineer will set the rate at time of application.

Warm Mix Asphalt (WMA) is not permitted in any mix type on this project.

RAP and RAS are not permitted in any surface and levelup mixes on this project.

Department-owned RAP is available to the Contractor. The stockpile location is Bridgewood Stockpile (32.75817, -97.21839) or IH-30 Lancaster Stockpile (32.74716,-97.30654).Contact the South Tarrant County Maintenance Office at 817-586-5575 or 682-774-4846 with at least 72 hours advance notice to coordinate the acquisition and accounting of the RAP material.

Grade substitution per Table 5 is not allowed.

Include the approved mix design number on each delivery ticket.

Use a Material Transfer Device (MTD) unless otherwise directed.

Shoulders, crossovers, and other areas listed on the Plan sheets or as directed are not subject to in-place air void determination for this project.

Temporary detours are subject to in-place air void determination for this project.

Use Surface Test Type B for this project.

Item 344. Superpave Mixtures

RAP aggregate must meet the requirements of Table 1.

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the travel lanes and shoulders.

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the surfaces other than the travel lanes.

No blending, of the material retained on the No. 4 sieve, to meet SAC A will be allowed for surface mixes.

Natural (field) sands are not allowed.

Provide a PG 70-28 asphalt for the surface course and level up course, if applicable.

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project. A trackless tack can be used in lieu of CSS-1P tack coat or as directed by the Engineer. The Engineer will set the rate at time of application.

Warm Mix Asphalt (WMA) is not permitted in any mix type on this project.

Grade substitution per Table 5 is not allowed.

Provide a mix design with the gradation curve below the restricted zone.

Include the approved mix design number on each delivery ticket.

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Use a Material Transfer Device (MTD) unless otherwise directed.

Shoulders, crossovers, and other areas listed on the Plan sheets or as directed are not subject to in-place air void determination for this project.

Temporary detours are subject to in-place air void determination for this project.

Use Surface Test Type B for this project.

Item 351. Flexible Pavement Structure Repair

The section of roadway where the repair is to be made will be the entire width of the lane and a minimum length of 50 feet, unless otherwise directed by the Engineer.

Item 354. Planing and Texturing Pavement

Intent is to remove the proposed depth of HMAC from existing concrete in one pass. Repair damaged concrete paving caused by Contractor's operations at the expense of the Contractor as directed by the Engineer.

Take precaution to avoid damage to existing bridge decks and bridge joints including but not limited to armor joints, header joints, relieve joints, etc. Repair any damage to the bridge decks and/or joints as approved. This work will not be paid directly, but will be performed at the Contractor's expense.

Item 360. Concrete Pavement

When using rebar support chairs to support reinforcing steel and clips for crossed reinforcing bars, chair spacing may be increased to 1.67 sq. yd. per chair, placed in a diamond or square pattern. Do not exceed 60" longitudinal spacing.

The provisions of Article 360.6.2, "Deficient Thickness Adjustment," will not be a requirement and the pavement will not be cored.

Include the approved mix design number on each delivery ticket.

Use 6x12 inches cylinders for concrete strength tests when Class P concrete and Class HES concrete are used.

Item 361. Full Depth Repair of Concrete Pavement

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project.

Schedule work so that concrete placement follows full-depth saw cutting by no more than 7days.

Include the approved mix design number on each delivery ticket.

Use 6x12 inches cylinders for concrete strength tests when Class P concrete and Class HES concrete are used.

Item 400. Excavation and Backfill for Structures

Class B bedding will be permitted in lieu of Class C bedding.

Recycled flex base and RAP are allowed individually or combined for use as granular material and backfill in Class B and C bedding at the discretion of the Engineer. These materials must meet the requirements of Table 1. The Engineer may require the mixing of one or both of these materials with the local soil to provide a cohesive material for compaction and stability of the backfill around the pipe or box culvert.

Item 403. Temporary Special Shoring

Obtain railroad approval for any alternate temporary shoring designs. The contractor is responsible for all costs associated with obtaining such approval. No additional time will be granted as compensation for delays resulting from failure to obtain timely railroad approval of temporary shoring designs.

Item 421. Hydraulic Cement Concrete

For Class P (Item 360) and S (Item 421) Concrete Only: For concrete plants equipped with 2 aggregate bins or no calibrated metering system, blend manufactured and natural sand at the aggregate source only. For concrete plants equipped with a minimum of 3 bins and a calibrated metering system, blending of the separate sands on-site is permitted to meet gradation and AIR requirements.

Strength/cylinder testing equipment must be equipped with a printer for an electronic print out of all test results.

Air entrainment requirements are waived for all classes of concrete except all Class S and all Class P concrete.

Concrete will not be rejected for low air content. Adjustment to the dosage of air entrainment will be as directed or allowed by the Engineer.
Include the approved mix design number on each delivery ticket.

Furnish a hard copy of all testing equipment calibration reports at the preconstruction meeting when non-TxDOT equipment is used to test concrete. Furnish updated reports as equipment is calibrated through the project contract. The calibration frequency will match TxDOT's and will apply for each piece of equipment as follows:

Slump Cone - Annual
Air Meter - Every 3 months
Compression Tester - Annual
Beam breaker - Annual

The Engineer may allow the use of local commercial laboratories under contract to provide these services. The Commercial Laboratory must fulfill requirements listed above prior to performing any work.

Item 423. Retaining Walls

The backfill material for precast retaining walls shall be approved before placement. Build stockpile(s) in lifts not to exceed 2 feet and a minimum working face of not less than 10 feet, but not more than 20 feet.

TxDOT does not allow the use of experimental systems on projects with over 50,000 square feet walls over 25 ft. tall, or walls supporting or immediately adjacent to interstate highways.

When proprietary wall systems are used, a qualified representative of the retaining wall manufacturer must be available upon request during wall construction. As requested or required the manufacturer’s representative must be on site to assist with the initial stages of wall construction, provide training to the Contractor wall crew and ensure proper interpretation of MSE wall shop drawings and details. Specific attention must be given to nonstandard wall installation details. The Contractor’s wall crew foreman must be on site for the duration of wall construction. Any change to the wall crew foreman may require additional training by the wall supplier. The Contractor will ensure that the retaining walls are installed per the details presented in the construction drawings and as per the proprietary wall system requirements. The Engineer reserves the right to suspend wall construction activities due to any construction issue encountered.

Horizontal and vertical nail spacing on temp or permanent soil nail walls shall not exceed 4 ft.

Type DS material will be required on MSE walls in the area of the reinforcement mats.

The following Mechanically Stabilized Earth (MSE) panel type systems are approved for use on TxDOT projects:

http://www.txdot.gov/inside-txdot/division/bridge/approved-systems/mse-wall.html

The following Concrete Block Retaining Wall Systems are approved for use on TxDOT projects:

http://www.txdot.gov/inside-txdot/division/bridge/approved-systems/retaining-system.html

Item 432. Riprap

Provide weep holes as directed.

The quantities for riprap at the location indicated may be varied to the extent necessary to ensure proper functioning for the purpose intended.

All concrete riprap will be 5" (.42') in thickness, unless otherwise shown on the plans, and must be reinforced.

Locations and lengths of riprap flumes shown on the plans are approximate. Actual lengths and locations are to be determined in the field.

When synthetic fiber reinforcement concrete option is chosen, provide the following:

- At all construction joints (vertical or horizontal) provide #3 bars 24 in. long and placed on 18 in. centers along joint length. Bars should be centered in concrete cross section.

- At all toe wall locations #3 L-bars will be required on 18 in. centers with a length 2 times the depth of the toe wall. Place three #3 bars the length of the toe wall and equally spaced on the L-bars.

Item 440. Reinforcement for Concrete

Top and bottom layers of slab reinforcing steel shall be epoxy coated.

Item 464. Reinforced Concrete Pipe

All bends and connections in pipe must be prefabricated.

Item 496. Removing Structures

NBI 02-220-0-0172-01-001- Lead was detected in Grey Paint over Green Paint on West and East Side Bridge Rails

County: Tarrant

Highway: BU 287P

Item 502. Barricades, Signs, and Traffic Handling

The contractor force account ‘safety contingency’ that has been established for this project is intended to be utilized for work zone enhancements to improve the effectiveness of the traffic control plan that could typically not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor’s responsible person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Permanent signs may be installed when construction in an area is complete and they will not conflict with the traffic control plan for the remainder of the job.
Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Any sign not detailed in the plans but called for in the layout will be as shown in the current "Standard Highway Sign Designs for Texas”.

When traffic is obstructed, arrange warning devices in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

Cover or remove any work zone signs when work or condition referenced is not occurring.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Item 503. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

Two electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane

4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay
12. Max Speed ** MPH
13. Merge Right
14. Merge Left
15. No Exit Next ** Miles

Item 504. Field Office and Laboratory

Furnish the following structures for this project:

Type	No.
Field Lab (Ty. D)	1

Item 505. Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 1 additional shadow vehicle(s) with TMA for TCP (2-4)-18, and as detailed on General Note of this standard sheet.

Therefore, 2 total shadow vehicles with TMA will be required for this type of work. Determine if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

County: Tarrant

Highway: BU 287P

0172-01-055

TCP 2 Series	Phase#	Required TMA	Number of days	Total Number of Days
(2-4)-18	II	1	75	75
(2-6)-18	II	1	69	69
			Final Number of Days for Required Stationary TMA	144

TCP 3 Series	Phase#	Required TMA	Number of days	Total Number of Days
(3-1)-13	II & IV	2	11	22
(3-2)-18	II & IV	3	6	18
(3-3 C)-14	II & IV	2	6	12
(3-3 D)-15	IV	3	6	18
			Final Number of Days for Stationary TMA	70

0172-01-057

	TMA Stationary	Days	Total Days	TMA Mobile Operations	Days	Total Days
Phase 1A	1	46	46	1	3	3
Phase 1B	1	58	58	1	6	6
Total			**104**			**9**

County: Tarrant

Highway: BU 287P

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

The SW3P for this project will consist of using the following items as directed:

- Temp Sediment Control Fence
- Erosion control logs

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Item 512. Portable Concrete Traffic Barrier

Used barrier will be inspected and approved by the Engineer prior to using.

"*Furnish and Install*" barrier in compliance with Concrete Safety Barrier (CSB), Single-Slope Concrete Barrier (SSCB), or Low Profile Concrete Barrier (LPCB) standards as shown on the plans.

Furnish Class H Concrete with a minimum 28 day compressive strength of 3,600 psi.

Provide the hardware assemblies to join barrier sections, including barrier from stockpile.

Provide (2) 1-1/4" x 2'2" threaded rods, (4) standard USS washers, grade 5, (4) 1-1/4" hex nuts, and (2) 5" x 10" x 3/8" plate washers for each section of LPCB.

Delineate all barriers in accordance with Barricade and Construction (BC) Standard sheets. Barrier delineation will not be paid for directly, but will be subsidiary to Item 512,"Portable Concrete Traffic Barrier".

Remove and replace traffic barrier damaged by the traveling public and no longer serviceable as directed. Replace traffic barrier with Contractor furnished barrier or Department-furnished barrier from designated stockpile as directed. Additional payment will be provided as compensation to remove, replace and dispose of the traffic barrier damaged by the traveling public in accordance with Item 512.

Items 530 And 531. Intersections, Driveways and Turnouts, and Sidewalks

The furnishing and installation of the sand cushion in proposed sidewalks, sidewalk ramps, and driveways will not be paid for directly but will be subsidiary to this bid item.

Item 556. Pipe Underdrains

Install pipe underdrains at locations shown on the plans or as directed.

The unit price bid per foot of "pipe underdrain" will include the cost of making connections to storm drain lines.

Item 585. Ride Quality for Pavement Surfaces

Before performing work, the Engineer will determine whether Surface Test Type A will be used instead of the specified payment adjustment schedule when the following conditions exist in existing travel lanes:

- travel lane is directly adjacent to existing curb and gutter, or
- travel lane has repair areas or crack sealing that may result in reflective defects.

Use Surface Test Type B pay adjustment schedule 2 to evaluate ride quality of the travel lanes in accordance with Item 585, “Ride Quality for Pavement Surfaces.”

Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

If retroreflectivity readings are collected using a portable or handheld unit, then measurement is defined as a collective average of at least 20 readings taken along a 200-foot test section. A minimum of three measurements will be required per mile of roadway. Measurements collected on a centerline stripe will be averaged separately for stripe in each direction of travel. A TxDOT inspector must witness the calibration and collection of all retro-reflectivity data.

Item 624. Ground Boxes

Signals:
Slack conductors required by Standard Sheet ED(3)-14 will be subsidiary to Item 624.

Concrete removal required for installation of ground boxes will be subsidiary to Item 624.

Ground all junction boxes mounted on bridges and underpasses with a ground rod in the nearest ground box.

All new mast arm mounted signal heads to be mounted horizontally.

City of Fort Worth Signal Standards:

Traffic Signals:

1. Prior to activating traffic signals with new or revised signal timing, the contractor shall e-mail Cedric Dorsey, Assistant Superintendent, cedric.dorsey@fortworthtexas.gov and copy Aziz Rahman, Engineering Manager, at aziz.rahman@fortworthtexas.gov at least two (2) weeks in advance to schedule that.

2. If new cabinets and controllers are being installed and furnished by the contractor and the controllers need to be programmed and tested by City Forces; the contractor shall deliver them to the City of Fort Worth, Signal Shop at 5001 James Ave, at least two (2) weeks in advance to schedule that.

3. Notify Cedric Dorsey (817-319-7895) at least 48-hours in advance of all concrete pours. Inspector must be present when concrete is placed on the project site.

4. **If applicable,** equipment supplied by the City will be available for pick up from the Transportation/Public Works (T/PW) Warehouse at 5001 James Avenue. The Assistant Superintendent must authorize all equipment pickups.

5. Contractor shall provide a 5-year manufacturer warranty on APS systems. The warranty documentation shall include the start date (when material is delivered to job site) and the end date of the warranty and the serial number of the equipment.

6. The Contractor shall provide all materials needed to construct a fully operational traffic signal as called out for in the plans and specifications.

7. All existing signal equipment shall remain in place and operating until new equipment is in place and ready to operate.

8. The Contractor shall contact TPW Superintendent, at 817-392-7239 at least one (1) week in advance of any disposal of material to coordinate any material that the city may need salvaged. The Contractor is responsible for hauling and properly disposing of salvaged material from the job site to a disposal site of their choosing. The Contractor will not be allowed to drop off salvaged materials at the City yards unless otherwise directed by TPW Superintendent for the specified material only.

Foundations:

1. Dimensions shown on plans for locations of signal foundations, conduit, and other items may vary in order to meet local conditions. All locations of foundations, conduit, and ground boxes shall be approved by Traffic Signal Engineering.

2. Contractor shall contact Cedric Dorsey (817-319-7895) prior to pouring cabinet foundation to be sure that template and bolt patterns are correct for type of cabinet being supplied. Foundation shall be installed per City Specification and City Detail.

3. Pier Foundations shall be poured together in one piece.

4. No signal poles shall be placed on foundations prior to five (5) calendar days following pouring of concrete.

5. Contractor shall clean up and remove all loose material resulting from construction operations each day prior to the work is being suspended.

6. Controller cabinet concrete apron shall be subsidiary to the bid item for the controller cabinet foundation. Cabinet foundation and apron shall be poured together in one piece.

Controller and Cabinet:

1. Contractor shall install controller cabinet and connect all associated field wiring.

2. City will install signal timing and program controller.

3. Prior to any cabinet removal, all existing modem, power supplies, ethernet cable, unmanaged network switch and antennas from existing cabinet shall be transferred and installed in new cabinet by the city. Contractor must notify Anthony Vasquez (817-201-1284) or James Rensing (817-701-6760) at least one (1) week in advance prior to removal of existing cabinet.

Detection System:

1. The City will furnish the detection system and Contractor shall install the detection system and furnish/install cable unless otherwise called out in the plans.

2. The Contractor shall install, aim and program all detectors as per City Standard Specifications and City Details.

3. The Contractor shall refer to City Standard Details and project plans for detection zones placement.

CONTROL : 0172-01-055, ETC
PROJECT : F 2025(292), ETC
HIGHWAY : BU 287P
COUNTY : TARRANT

TEXAS DEPARTMENT OF TRANSPORTATION

GOVERNING SPECIFICATIONS AND SPECIAL PROVISIONS

ALL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT ARE IDENTIFIED AS FOLLOWS:

STANDARD SPECIFICATIONS: ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION SEPTEMBER 1, 2024. STANDARD SPECIFICATIONS ARE INCORPORATED INTO THE CONTRACT BY REFERENCE.

ITEMS 1 TO 9 INCL., GENERAL REQUIREMENTS AND COVENANTS
ITEM 100 PREPARING RIGHT OF WAY <103><752>
ITEM 104 REMOVING CONCRETE
ITEM 105 REMOVING TREATED AND UNTREATED BASE AND ASPHALT PAVEMENT
ITEM 110 EXCAVATION <132>
ITEM 132 EMBANKMENT <100><110><160><204><210><216><400>
ITEM 134 BACKFILLING PAVEMENT EDGES <162><166><168><300><314>
ITEM 161 COMPOST <160>
ITEM 162 SODDING FOR EROSION CONTROL <164><166><168>
ITEM 168 VEGETATIVE WATERING
ITEM 316 SEAL COAT <210><300><302><341><520>
ITEM 341 DENSE-GRADED HOT-MIX ASPHALT <300><301><320><520><585>
ITEM 344 SUPERPAVE MIXTURES <300><301><320><504><520><585>
ITEM 351 FLEXIBLE PAVEMENT STRUCTURE REPAIR <132><204><247><260> <275><276><292><310><316><330><334><341>
ITEM 354 PLANING AND TEXTURING PAVEMENT
ITEM 361 FULL-DEPTH REPAIR OF CONCRETE PAVEMENT <360><421><440>
ITEM 402 TRENCH EXCAVATION PROTECTION
ITEM 403 TEMPORARY SPECIAL SHORING <410><411>
ITEM 420 CONCRETE SUBSTRUCTURES <400><404><421><422><426><427> <440><441><448>
ITEM 423 RETAINING WALLS <110><132><216><400><416><420><421><424> <440><445><458><556>
ITEM 432 RIPRAP <247><420><421><431><440>
ITEM 438 CLEANING AND SEALING JOINTS <454>
ITEM 450 RAILING <420><421><422><424><440><441><442><445><446> <448><540>
ITEM 454 BRIDGE EXPANSION JOINTS <429><442><785>
ITEM 464 REINFORCED CONCRETE PIPE <400><402><403><467><476>
ITEM 465 JUNCTION BOXES, MANHOLES, AND INLETS <400><420><421><440>

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          <471>
ITEM 471  FRAMES, GRATES, RINGS, AND COVERS <441><445><448><465>
ITEM 479  ADJUSTING MANHOLES AND INLETS <400><421><465><471>
ITEM 500  MOBILIZATION
ITEM 502  BARRICADES, SIGNS, AND TRAFFIC HANDLING <503><505><510>
ITEM 503  PORTABLE CHANGEABLE MESSAGE SIGN
ITEM 505  TRUCK-MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)
ITEM 506  TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL
          CONTROLS <161><432><556>
ITEM 512  PORTABLE TRAFFIC BARRIER <420><421><424><440><442><502>
ITEM 529  CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER <360>
          <420><421><440>
ITEM 530  INTERSECTIONS, DRIVEWAYS, AND TURNOUTS <247><260><275>
          <276><292><316><330><334><341><360><421><440>
ITEM 531  SIDEWALKS <104><360><420><421><440><530>
ITEM 556  PIPE UNDERDRAINS <402><421><432>
ITEM 624  GROUND BOXES <420><421><432><440><618><620>
ITEM 644  SMALL ROADSIDE SIGN ASSEMBLIES <421><440><441><442><445>
          <636><656>
ITEM 658  DELINEATOR AND OBJECT MARKER ASSEMBLIES <445>
ITEM 662  WORK ZONE PAVEMENT MARKINGS <666><668><672><677>
ITEM 666  RETROREFLECTORIZED PAVEMENT MARKINGS <316><502><662><667>
          <677><678><6438>
ITEM 672  RAISED PAVEMENT MARKERS <677><678>
ITEM 690  MAINTENANCE OF TRAFFIC SIGNALS AND ILLUMINATION <104>
          <400><416><421><431><432><440><445><449><450><476><610>
          <613><614><616><618><620><621><622><624><625><627><628>
          <636><656><680><682><684><685><686>
ITEM 764  PUMP STATIONS AND DRAINAGE SYSTEM CLEANING


SPECIAL PROVISIONS:  SPECIAL PROVISIONS WILL GOVERN AND TAKE
------------------   PRECEDENCE OVER THE SPECIFICATIONS ENUMERATED
                     HEREON WHEREVER IN CONFLICT THEREWITH.


WAGE RATES
SPECIAL PROVISION "NONDISCRIMINATION" (000---001)
SPECIAL PROVISION "CERTIFICATION OF NONDISCRIMINATION IN EMPLOYMENT"
                     (000---002)
SPECIAL PROVISION "STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
                     CONSTRUCTION CONTRACT SPECIFIC" (000---003)
SPECIAL PROVISION "ONTHEJOB TRAINING PROGRAM" (000---004)
SPECIAL PROVISION "CARGO PREFERENCE ACT REQUIREMENTS IN FEDERAL AID
                     CONTRA" (000---007)
SPECIAL PROVISION "NOTICE OF CONTRACTOR PERFORMANCE EVALUATIONS"
                     (000---016)
SPECIAL PROVISION "CERTIFICATE OF INTERESTED PARTIES (FORM 1295)"
                     (000---017)
SPECIAL PROVISION "IMPORTANT NOTICE TO CONTRACTORS" (000---018)
SPECIAL PROVISION "NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO
                     ENSURE EQUAL EMPLOYEMENT OPPORTUNITY (EXECUTIVE O
                    RDER 11" (000---020)
SPECIAL PROVISION "DISADVANTAGED BUSINESS ENTERPRISE IN FEDERALAID"
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(000---022)
SPECIAL PROVISION TO ITEM 6 (006---001)

SPECIAL SPECIFICATIONS:

ITEM 3010 RAISING AND UNDERSEALING CONCRETE SLABS WITH FOAM SYSTEMS
ITEM 6017 MULTI-SENSOR VEHICLE DETECTION SYSTEM FOR SIGNALIZED INTERSECTION
ITEM 6040 HIGHWAY TRAFFIC SIGNALS (COFW) <610><625><636>

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 SPECIFICATIONS FOR THIS PROJECT.

Control **0172-01-055, ETC.**

Project **F 2025(292), ETC.**

Highway **BU 287P**

County **TARRANT**

DISADVANTAGED BUSINESS ENTERPRISE REQUIREMENTS

The following goal for disadvantaged business enterprises is established:

DBE
8.0%

Certification of DBE Goal Attainment

By signing the proposal, the Bidder certifies that the above DBE goal will be met by committing to DBE participation that meets or exceeds the goal or providing adequate documentation of good faith efforts (GFE) to achieve the goal.

The DBE participation or GFE must be submitted within five (5) calendar days after bid opening. If the fifth day falls on a weekend or a day when TxDOT offices are closed, the deadline moves to the next business day.

The Department may impose remedies as defined by state or local law if a bidder fails to submit required documentation, including forfeiting the bid proposal guaranty and exclusion from rebidding on the contract if it is re-advertised.

CHILD SUPPORT STATEMENT

Under Section 231.006, Family Code, the vendor or applicant certifies that the individual or business entity named in this contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate.

CONFLICT OF INTEREST CERTIFICATION

Pursuant to Texas Government Code Section 2261.252(b), the Department is prohibited from entering into contracts in which Department officers and employees have a financial interest.

By signing the Contract, the Contractor certifies that it is not prohibited from entering into a Contract with the Department as a result of a financial interest as defined under Texas Government Code Section 2261.252(b), and that it will exercise reasonable care and diligence to prevent any actions or conditions that could result in a conflict of interest with the Department.

The Contractor also certifies that none of the following individuals, nor any of their family members within the second degree of affinity or consanguinity, owns 1% or more interest or has a financial interest as defined under Texas Government Code Section 2261.252(b) in the Contractor:

- Any member of the Texas Transportation Commission; and
- The Department's Executive Director, General Counsel, Chief of Procurement and Field Support Operations, Director of Procurement, and Director of Contract Services.

Violation of this certification may result in action by the Department.

E-VERIFY CERTIFICATION

Pursuant to Texas Transportation Code §223.051, all TxDOT contracts for construction, maintenance, or improvement of a highway must include a provision requiring Contractors and subcontractors to use the U.S. Department of Homeland Security's E-Verify system to determine employment eligibility. By signing the contract, the Contractor certifies that prior to the award of the Contract:

- the Contractor has registered with and will, to the extent permitted by law, utilize the United States Department of Homeland Security's E-Verify system during the term of the Contract to determine the eligibility of all persons hired to perform duties within Texas during the term of the agreement; and
- the Contractor will require that all subcontractors also register with and, to the extent permitted by law, utilize the United States Department of Homeland Security's E-Verify system during the term of the subcontract to determine the eligibility of all persons hired to perform duties within Texas during the term of the agreement.

Violation of this requirement constitutes a material breach of the Contract, subjects a subcontractor to removal from the Contract, and subjects the Contractor or subcontractors to possible sanctions in accordance with Title 43, Texas Administrative Code, Chapter 10, Subchapter F, "Sanctions and Suspension for Ethical Violations by Entities Doing Business with the Department."

Certification Regarding Disclosure of Public Information

Pursuant to Subchapter J, Chapter 552, Texas Government Code, contractors executing a contract with a governmental body that results in the expenditure of at least $1 million in public funds must:

1) preserve all contracting information* as provided by the records retention requirements applicable to Texas Department of Transportation (TxDOT) for the duration of the contract,
2) on request of TxDOT, promptly provide any contracting information related to the contract that is in the custody or possession of the entity, and
3) on completion of the contract, either:
    A. provide, at no cost to TxDOT, all contracting information related to the contract that is in the custody or possession of the entity, or
    B. preserve the contracting information related to the contract as provided by the records retention requirements applicable to TxDOT

The requirements of Subchapter J, Chapter 552, Government Code, may apply to this contract, and the contractor or vendor agrees that the contract can be terminated if the contractor or vendor knowingly or intentionally fails to comply with a requirement of that subchapter.

By entering into Contract, the Contractor agrees to:

- provide, or make available, to TxDOT and any authorized governmental investigating or auditing agency all records, including electronic and payment records related to the contract, for the same period provided by the records retention schedule applicable to TxDOT, and
- ensure that all subcontracts include a clause requiring the same.

* As defined in Government Code §552.003, "Contracting information" means the following information maintained by a governmental body or sent between a governmental body and a vendor, contractor, potential vendor, or potential contractor:

1) information in a voucher or contract relating to the receipt or expenditure of public funds by a governmental body;
2) solicitation or bid documents relating to a contract with a governmental body;
3) communications sent between a governmental body and a vendor, contractor, potential vendor, or potential contractor during the solicitation, evaluation, or negotiation of a contract;
4) documents, including bid tabulations, showing the criteria by which a governmental body evaluates each vendor, contractor, potential vendor, or potential contractor responding to a solicitation and, if applicable, an explanation of why the vendor or contractor was selected; and
5) communications and other information sent between a governmental body and a vendor or contractor related to the performance of a final contract with the governmental body or work performed on behalf of the governmental body.

CERTIFICATION TO NOT BOYCOTT ISRAEL

Pursuant to Texas Government Code §2271.002, the Department must include a provision requiring a written verification affirming that the Contractor does not boycott Israel, as defined in Government Code §808.001, and will not boycott Israel during the term of the contract. This provision applies to a contract that:

1) is with a Contractor that is not a sole proprietorship,
2) is with a Contractor with 10 or more full-time employees, and
3) has a value of $100,000 or more.

By signing the contract, the Contractor certifies that it does not boycott Israel and will not boycott Israel during the term of this contract. “Boycott” means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with 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.

Violation of this certification may result in action by the Department.

CERTIFICATION TO NOT BOYCOTT ENERGY COMPANIES

Pursuant to Texas Government Code §2274.002, the Department must include a provision requiring a written verification affirming that the Contractor does not boycott energy companies, as defined in Government Code §809.001, and will not boycott energy companies during the term of the contract. This provision applies to a contract that:

1) is with a Contractor that is not a sole proprietorship,
2) is with a Contractor with 10 or more full-time employees, and
3) has a value of $100,000 or more.

By signing the contract, the Contractor certifies that it does not boycott energy companies and will not boycott energy companies during the term of this contract. “Boycott” means taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company: (1) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; or (2) does business with a company described by (1).

Violation of this certification may result in action by the Department.

CERTIFICATION TO NOT DISCRIMINATE AGAINST FIREARM ENTITIES OR FIREARM TRADE ASSOCIATIONS

Pursuant to Texas Government Code §2274.002, the Department must include a provision requiring a written verification affirming that the Contractor:

1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as defined in Government Code §2274.001, and
2) will not discriminate against a firearm entity or firearm trade association during the term of the contract.

This provision applies to a contract that:

1) is with a Contractor that is not a sole proprietorship,
2) is with a Contractor with 10 or more full-time employees, and
3) has a value of $100,000 or more.

By signing the contract, the Contractor certifies that it does not discriminate against a firearm entity or firearm trade association as described and will not do so during the term of this contract. "Discriminate against a firearm entity or firearm trade association" means, with respect to the entity or association, to: (1) refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; (2) refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or (3) terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association. "Discriminate against a firearm entity or firearm trade association" does not include: (1) the established policies of a merchant, retail seller, or platform that restrict or prohibit the listing or selling of ammunition, firearms, or firearm accessories; (2) a company's refusal to engage in the trade of any goods or services, decision to refrain from continuing an existing business relationship, or decision to terminate an existing business relationship to comply with federal, state, or local law, policy, or regulations or a directive by a regulatory agency, or for any traditional business reason that is specific to the customer or potential customer and not based solely on an entity 's or association's status as a firearm entity or firearm trade association.

Violation of this certification may result in action by the Department.

PROHIBITION ON CERTAIN TELECOMMUNICATIONS EQUIPMENT OR SERVICES

The Federal Register Notice issued the Final Rule and states that the amendment to 2 CFR 200.216 is effective on August 13, 2020. The new 2 CFR 200.471 regulation provides clarity that the telecommunications and video surveillance costs associated with 2 CFR 200.216 are unallowable for services and equipment from these specific providers. OMB's Federal Register Notice includes the new 2 CFR 200.216 and 2 CFR 200.471 regulations.

https://www.federalregister.gov/documents/2020/08/13/2020-17468/guidance-for-grants-and-agreements

Per the Federal Law referenced above, use of services, systems, or services or systems that contain components produced by any of the following manufacturers is strictly prohibited for use on this project. Therefore, for any telecommunications, CCTV, or video surveillance equipment, services or systems cannot be manufactured by, or have components manufactured by:

- Huawei Technologies Company,
- ZTE Corporation (any subsidiary and affiliate of such entities),
- Hyatera Communications Corporation,
- Hangzhou Hikvision Digital Technology Company,
- Dahua Technology Company (any subsidiary and affiliate of such entities).

Violation of this prohibition will require replacement of the equipment at the contractor's expense.

Special Specification 3010

Raising and Undersealing Concrete Slabs with Foam Systems

1. DESCRIPTION

Raise and underseal concrete slabs at locations shown on the plans and as directed.

2. MATERIAL

Furnish a closed cell hydro-insensitive, high-density polyurethane foam system with a minimum free rise density of 3.0 lb. per cubic foot, with a minimum compressive strength of 50 psi. Use epoxy material meeting the requirements of DMS-6100, "Epoxies and Adhesives," Type III, Class C.

3. EQUIPMENT

Provide machinery, tools, and equipment necessary for proper execution of the work. At a minimum, provide the following.

3.1. **Drill**. Use a drill capable of drilling holes of the required diameter and depth.

3.2. **Pump**. Furnish a pump unit with the appropriate attachments capable of injecting the polyurethane:

- under the concrete slab at the depth or depths required on the plans, and
- at a controlled flow rate with a digital reading of the cumulative pounds used.

3.3. **Level**. Provide control equipment to indicate when the final grade has been achieved and to monitor slab movement.

4. CONSTRUCTION

4.1. **Preparation**. Prepare a profile of each area to determine the extent of the concrete slab that requires adjustment or raising. Ensure that the finished concrete slabs will conform to the grades and cross-section of the slabs as shown on the plans or as directed. Determine the exact locations of the injection holes for each treated area. Obtain approval for the injection hole locations.

4.2. **Drilling**. Use drilling operations that do not damage the surrounding concrete. Drill injection holes with diameters less than or equal to 3/4 in. through the concrete as proposed or as directed. When an injection point is through a terminal anchor slab and sleeper slab, provide a tube to ensure the polyurethane material does not migrate between the two slabs.

4.3. **Injection**. Inject high-density polyurethane formulation directly under the slab. Do not extend the nozzle end below the bottom of the concrete. Cease injection when directed, no improvement is observed, or material extrudes from locations other than slab penetrations. Take precautions to prevent the intrusion of injected material into any drainage facility and other structures. Remove any excessive polyurethane material after the nozzle is removed from the hole. Seal the hole using an approved method and material.

4.4. **Grade Control**. Control the final elevations within 1/4 in. of the proposed profile elevations. The Engineer may check the treated area to confirm that the pavement has been aligned properly to facilitate drainage.

4.5. **Repairs**. As directed, repair any pavement slab or bridge approach or departure slab that has cracked or did not achieve required grades as a result of the Contractor's operation at no additional cost to the Department.

Fill injection holes with epoxy or approved concrete patching materials.

5. SET TIME

Formulate the high-density polyurethane to set and obtain 90% of its compressive strength within 15 min. after injection. Attain the manufacturer's recommended compressive strength unless otherwise shown on the plans.

6. MEASUREMENT

This Item will be measured by the pound of high-density polyurethane injected and accepted.

7. 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 "Raising and Undersealing Concrete Slab." This price is full compensation for furnishing and injecting polyurethane material, concrete repairs, labor, materials, tools, and incidentals.

Special Specification 6017

Multi-Sensor Vehicle Detection System for Signalized Intersection

1. DESCRIPTION

Furnish, install, relocate, or remove vehicle detection system (VDS) at locations shown on the plans, or as directed. Use approved VDS listed on the Department's MPL.

2. MATERIALS

2.1. **General**. Furnish, assemble, and install only new materials except as allowed for relocation of VDS equipment as shown on the plans, or as directed. Contractor must provide the VDS at each intersection as a system from the same manufacturer.

VDS must analyze sensor inputs and produce vehicle detector outputs that can serve as inputs to a traffic signal controller. Provide VDS field equipment that is compatible with existing infrastructure and software located in the Department's Traffic Management Control Centers across the state as directed. VDS must meet Department transportation sensor system protocol requirements when integrated with Traffic Management Control Center software or systems as shown on the plans.

VDS equipment must include the following.

- Cabinet control processor unit and associated devices required for system integration
- Data, power, and communication cable, connectors, and assemblies
- Sensor and mounting hardware to connect directly to a pole, mast arm, or other structure
  - Video imaging VDS (VIVDS) (fixed or variable focal length, 360° "fish-eye," or infrared),
  - Radar VDS (RVDS) (presence or advanced), or
  - Hybrid VDS (HVDS) (VIVDS and RVDS in combinations)

The VIVDS must use one or more cameras and video processing equipment to accurately provide detector calls for the intersection, approach, or roadway segment where they are installed, and provide detection as shown on the plans. A single camera placed per manufacturer recommendations must be capable of monitoring and detecting at least five lanes of traffic simultaneously.

The RVDS must use one or more radar sensors and processing equipment to accurately provide detector calls for the intersection, approach, or roadway segment where they are installed, and provide detection as shown on the plans. A single RVDS sensor placed per manufacturer recommendations must be capable of monitoring and detecting at least five lanes of traffic simultaneously. Once installed and aligned, RVDS must be able to automatically detect vehicle placement and track individual vehicles through the viewing range as specified by the manufacturer.

Ensure the system is designed and constructed with subassemblies, circuits, cards, and modules to maximize standardization and commonality.

Ensure field-replaceable parts are accessible for inspection and maintenance. Provide test points for checking essential voltages and waveforms.

VDS devices must self-recover from power failure once power is restored.

2.2. **Configuration and Management**. Ensure the VDS allows the user to fully configure or reconfigure the system and place detection zones locally or remotely using a monitor and input device, such as a keyboard, keypad, mouse, or touchscreen. Provide each VDS with all associated equipment required to configure and operate the system in a field environment.

Ensure that the VDS allows for the following.

- Configurable for remote monitoring
- Configurable for automated traffic signal performance measures (ATSPMs)
- Display detection zones and detection activations overlaid on live video
- Retainage of its programming in nonvolatile memory
- Stored configurations that may be modified for optimization and saved locally and remotely
- Normal operation during any configuration changes
- Adjustment or recalibration not required except when components are updated or realigned

2.3. **Detection Zones**. The VDS must allow a user to configure detection zones using a graphical user interface (GUI) superimposed on a video image of the roadway or simulated layout generated by the VDS processor based on sensor input. Ensure detection zones can be placed anywhere within GUI field of view (FOV). Ensure VDS detection zones can detect vehicle presence and collect traffic counts per lane. The VDS must be configurable to provide traffic volume, speed, and occupancy per lane.

Detection zones must appear as lines or polygons in the FOV. The system must allow at least eight detection zones per FOV. VDS detection zones must be able to provide detection equivalent to a 6-ft. × 6-ft. loop. Ensure zones can be sized, shaped, and overlapped to accurately detect vehicles at the locations shown on the plans.

The system must allow zones to be configured with directionality, delay, extension, and logic functions, including “AND” and “OR.” If each detection zone provides a unique output to the signal controller and the controller includes logical functions, then the VDS is not required to support logic functions.

Ensure zones displayed on a monitor provide a visual indication when vehicles are detected during configuration and operation.

2.4. **Detection**. VDS processor must compensate for minor sensor movement associated with environmental conditions, such as wind and thermal variations, throughout operation. Movement up to 2% of FOV at 400 ft. must not produce a false detection.

Ensure VDS processor operates regardless of whether monitoring equipment is connected. If monitoring equipment is connected to the processor unit, vehicle detections will be displayed real-time as they occur.

VDS must simultaneously detect vehicles in all lanes. VDS must be able to accurately detect approaching and departing vehicles in multiple lanes. VDS is configurable for which direction of travel to detect per lane. Ensure that vehicles traveling in any direction other than the configured direction of travel (e.g., cross-street and wrong-way traffic) do not activate a call to the controller, and that those detections could be configured to be disregarded or counted.

Ensure a constant call is placed on outputs associated with zones or sensors that are in an error state or failed, and that can be configured to be reported to the user. Ensure a constant call is placed on assigned outputs whenever the system is unable to provide accurate detection.

2.5. **Accuracy**. Ensure VDS individual lane accuracy for vehicle presence or advance detection is within 5% of actual.

2.6. **Video Imaging Camera Sensor**. Use color or thermal cameras that are provided as part of an engineered system by the VIVDS processor manufacturer or approved for use by the VIVDS processor manufacturer.

Ensure that analog cameras provide National Television Systems Committee (NTSC) composite video with a minimum resolution of at least 480 television lines (TVL).

Cameras must produce useable video suitable for detection in low light. Cameras with day and night modes must automatically and seamlessly transition between modes without producing vehicle detection errors such as false calls and missed calls. Nighttime monochrome operation must produce feature-resolvable video with luminance as low as 0.1 lux. Nighttime color operation must produce feature-resolvable video with luminance as low as 1.0 lux.

Cameras must produce resolvable features in the video with luminance as high as 10,000 lux.

Visual spectrum cameras must include automatic electronic shutter and iris control based on average scene luminance.

Variable focal length lenses must be adjustable from 6 mm–34 mm.

Processed images produced by the VIVDS must use a standard encoding format such as H.264 or MJPEG, unless otherwise shown on the plans.

The advanced camera enclosure must use 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 FOV by 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 lux–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 must be more than 50 decibels (dB) with the AGC disabled.

The imager must employ three-dimensional dynamic noise reduction to remove unwanted image noise.

The camera imager must employ wide dynamic range 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 based, use a charge-coupled device sensing element, and output color video with resolution of no less than 550 TVL.

The camera sensor must include an electronic shutter control based on 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 1/1 sec.–1/10,000th sec.

The camera sensor must use automatic white balance.

The camera sensor must include a variable focal length lens with variable focus that can be adjusted, without opening the camera housing, to suit the site geometry by a portable interface device designed for that purpose and manufactured by the detection system supplier.

The horizontal FOV must be adjustable from 4.6°–53.6°. This camera configuration may be used for most detection approaches 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 mm–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 preset positioning that stores 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 weathertight sealed enclosure conforming to IP-67. 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 provision for water diversion to prevent water from flowing in the camera's FOV.

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 ITO 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 temperatures from -34°C–+74°C and humidity from 0 relative humidity (RH)–100% RH. Measurement of satisfactory video must be based on detection processor (DP) system operation.

The camera sensor must acquire its power from the sensor data combiner.

Recommended camera placement height must be between 18 ft. and 33 ft. (or 6 m 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 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 weatherproof protective cover must be provided to protect all terminations at the camera.

2.6.1. **Thermal Cameras**. Thermal imaging cameras must use a long-life, uncooled vanadium oxide microbolometer thermal detector with a spectral range of 7.5 micrometers (µm)–13.5 µm.

Ensure analog video is NTSC-compliant and has a minimum NTSC array format of 320 × 240 with a 76,800-pixel effective resolution.

2.6.2. **Camera Enclosure**. Camera and lens assembly must be housed in an enclosure designed for outdoor use. The housing must be light in color to limit solar heating and prolong equipment life. Enclosure, including cable connections, must be waterproof and dust-tight with a NEMA Type 4 rating.

Ensure enclosures for visual spectrum cameras include a sunshield. Sunshield must protrude beyond the front edge of the enclosure and divert water away from the camera's FOV. Ensure the sunshield overhang is adjustable. Any plastics used in the construction of the enclosure must include ultraviolet inhibitors.

Ensure the enclosure allows the camera horizon to be rotated in the field during installation. Ensure camera focus and zoom can be adjusted, if necessary, without entering the camera enclosure.

The camera enclosure must be provided with mounting bracket designed to mount directly to a pole, mast arm, or other structure. Ensure the bracket allows the camera to be panned and tilted for alignment and then locked into place once properly positioned.

The camera enclosure with camera and lens installed must weigh 10 lb. or less.

Camera housing must include a means to prevent the formation of ice or condensation. If camera housing includes a heater, wiper, or other electronically controlled mechanism, such mechanism must not interfere with the camera operation or video signal.

2.7. **Radar Sensor**. The radar sensor must operate in the 24-gigahertz 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 with object speed detection within 0 mph–150 mph ±1.0 mph. The radar sensor must be able to detect vehicles per lane and at least up to four lanes.

The radar sensor must be housed in a weathertight sealed enclosure conforming to IP-67. The radar must operate in temperatures from -34°C–+74°C and humidity from 0% RH–100% RH. The housing must allow the radar to be adjusted to allow proper alignment between the sensor and the traveled road surface.

2.8. **Multi-Sensor Assembly**. Camera and radar sensors must be housed in a single enclosure assembly. The overall size of the multi-sensor enclosure must not exceed 14 in. × 15 in. × 17 in., and 11 lb. The effective projected area must not exceed 2.0 sq. ft.

The maximum power consumption for the multi-sensor assembly must be less than 10 W typical, 20 W peak.

2.9. **Sensor Data Combiner**. A sensor data combiner that combines sensor information from video and radar sensors must be employed for HVDS.

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 sensor unit.

The sensor data combiner must receive its primary power from an AC power source using industry-standard three-conductor cabling.

The sensor data combiner must communicate with the DP using a single coax cable. 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 weathertight sealed enclosure conforming to IP-67.

2.10. **DP**. Ensure the VDS includes inputs from the detectors and outputs to the traffic signal controller unit (CU) by the det, and provides data collection features, including storage and reporting of collected vehicle detection data, when shown on the plans.

VDS must be able to interface with the traffic CU by the detector rack, synchronous data link (SDLC), or another detector interface described in NEMA TS2-2016, unless otherwise shown on the plans. Solid-state detection outputs must meet NEMA TS2-2016, 6.5.2.26. The system must be able to provide 24 detection outputs. Ensure each zone and output is user-definable and previously saved zones can be redefined.

The system must be capable of functioning as a detector bus interface unit using an RS-485 SDLC connector. TS2, Type 1, VDS must include indicators that display detector output status for verification of calls.

Analog video inputs must use BNC connectors or be routed through existing loop inputs using connections designed for that purpose. Analog video outputs must use BNC or RCA connectors. Use of external cable connections to create a combined video output is not allowed.

Ensure processor includes provisions to view video image in the field and remotely.

VIVDS or HVDS processors installed in the traffic controller cabinet must use digital video or accommodate asynchronous, synchronous, and line-locked analog video as part of a complete system engineered by the manufacturer.

2.11. **Camera Interface Panel**. Supply the VIVDS with a camera interface panel as required by the manufacturer that provides a cabinet connection point between field wiring from VIVDS cameras and VIVDS equipment in the cabinet. The interface panel must be provided by the VIVDS manufacturer as part of a complete engineered system. The panel must include terminal facilities and surge suppression for all conductors used to connect VIVDS field equipment, including camera power and communications. Interface panels for analog cameras must include a 10-A breaker or blade-type fuses and a power terminal strip with at least eight 8/32 binder head screws for camera power connections. The panel must also have, at minimum, four coax protectors (EDCO CX06 or equivalent). Additional lightning and transient protection is allowed. All components that reside on the panel must be Department-approved. For cameras using Power over Ethernet, the interface panel must consist of surge protection meeting GR-1089.

Ensure interface panel is capable of being mounted on the sidewalls of the controller cabinet. Video connections must be isolated from earth ground.

2.12. **Cabling**. Supply the VDS with connector cables of the appropriate length for each installation site. Connector cables must include all conductors necessary for power, video, and communication. All cabling used must meet the minimum recommended specifications of the manufacturer.

Ensure the power and data cable connectors are IP-67 compliant to protect against intrusion of solids and water. External connectors must be quick-disconnect and keyed to prevent improper connections. All wiring must be color-coded and marked appropriately. Ensure all conductors that interface with the connector are encased in a single jacket.

If used, fiber optic cable must meet pertinent Department requirements.

If coaxial cable is used, it must be low-loss, 75-ohm, precision video cable suited for outdoor installation and approved by the manufacturer.

RS-485 and RS-232 communication cable must meet Special Specification 6004, “Networking Intelligent Transportation System (ITS) Communications Cable.”

2.13. **Communication**. Ensure that the VDS includes at least one serial or Ethernet communication interface.

Ensure serial interfaces and connectors conform to Telecommunications Industry Association- (TIA-) 232. Ensure that the serial ports support data rates up to 115,200 bits per second, error detection using parity bits (i.e., none, even, and odd), and stop bits (1 or 2).

Ensure that wired Ethernet interfaces provide a 10/100BASE-TX connection. Verify that all unshielded twisted pair and shielded twisted pair network cables and connectors comply with TIA-568.

Ensure that wireless communications are secure and that wireless devices are Federal Communications Commission- (FCC-) certified. Ensure that the FCC identification number is displayed on an external label and that all detection system devices operate within their FCC frequency allocation.

Ensure the system can be configured and monitored by one or more communication interfaces. Ensure that all communication addresses are user-programmable.

2.14. **Software**. Ensure the VDS manufacturer includes all software required to configure and monitor operation of VDS field equipment locally and remotely. VDS software must be a stable production release approved by the Department's Traffic Safety Division.

Ensure VDS computer software includes a GUI that displays all configured lanes and provides visual representation of all detected vehicles. Server software must be designed to run on the Windows Server operating system (Windows Server 2012 or newer). Client workstation software must be designed to run on Microsoft Windows 10 Professional and newer.

VDS software must allow the user to program, operate, exercise, diagnose, and read status of all VDS features and functions using a laptop computer.

VDS computer software must be able to communicate with VDS field devices using TCP/IP and serial connections. The software must provide for local and remote configuration and monitoring, including display of detection zone activations on live video and modification of existing detection zone layouts.

System software must provide the user complete control over the configuration process for VDS devices and allow the user to load new firmware into nonvolatile memory of VDS field devices locally and over any supported communication channel, including TCP/IP networks.

The system software must include the ability to retrieve and store data collected by VDS 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.

2.15. **Mechanical**. VDS detector card rack units must comply with dimensions specified in NEMA TS2-2016, 6.5.2.2.2.

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 stainless steel. Do not use self-tapping screws.

Ensure equipment is clearly and permanently marked with manufacturer name or trademark and part number, as well as date of manufacture or serial number.

Ensure VDS is modular in design for ease of field replacement and maintenance.

All printed circuit boards must have conformal coating to protect against moisture and fungus.

2.16. **Electrical**. Ensure equipment is designed to protect personnel from exposure to high voltage during installation, operation, and maintenance. Ensure all connections include the manufacturer-recommended surge protective device (SPD). SPDs must not interfere with the performance of the VDS. VDS electrical design must be modular.

Ensure the VDS operates on nominal 120 V AC. A power converter must be provided for devices that do not operate on nominal 120 V AC. Sensors must operate between 12 V DC and 28 V DC.

2.17. **Environmental**. All VDS devices must operate properly while and after being subjected to the environmental testing procedures described in NEMA TS2, Section 2. VDS sensors must be able to withstand the maximum wind load defined in the Department's basic wind velocity zone map standard without any damage or loosening from structure.

2.18. **Connectors and Harnesses**. External connections exposed to the outdoor environment must be made with weatherproof connectors. Connectors must be keyed to ensure correct alignment and mating.

Ensure all conductors are properly color-coded and identified. Ensure that every conductive contact surface or pin is gold-plated or made of a noncorrosive, nonrusting, conductive metal.

RS-485 and RS-232 communication cables must:

- be shielded, twisted pair cable with a drain wire;
- have a nominal capacitance conductor-to-conductor @ 1Khz ≥26pF/ ft.;
- have nominal conductor DC resistance @ 68°F ≤15 ohms/1,000 ft.;
- be one continuous run with no splices, and
- be terminated only on the two farthest ends of the cable.

2.19. **Documentation**. Provide hardcopy operation and maintenance (O&M) manuals, along with a copy of all product documentation on electronic media. Include the following documentation for all system devices and software.

- Operator manuals
- Installation manuals with installation procedures
- Maintenance and troubleshooting procedures
- Manufacturer's specifications (functional, electrical, mechanical, and environmental)

Provide certification from an independent laboratory demonstrating compliance with NEMA-TS2 environmental requirements for temperature, humidity, transients, vibration, and shock.

Provide certification that VDS electronic equipment meets FCC Class B requirements for electromagnetic interference and emissions.

Ensure the VDS system manufacturer has a quality assurance program for manufacturing VDS as described in this Specification. Manufacturer of the VDS must be ISO-9001 certified, or provide a copy of the company quality manual for review.

The VDS must pass testing to ensure functionality and reliability before delivery. Test results and supporting documentation, including serial number tested, must be submitted for each VDS. If requested, manufacturing data per serial number must be provided for each VDS.

2.20. **Warranty**. Warrant the equipment against defects or failure in design, materials, and workmanship for at least 5 yr. or in accordance with the manufacturer's standard warranty if that warranty period is greater. The start date of the manufacturer's standard warranty will begin after the equipment has successfully passed all tests contained in the final acceptance test plan. Any VDS equipment with less than 90% of its warranty remaining after the final acceptance test is completed will not be accepted by the Department. Guarantee

that equipment furnished and installed for this project performs per the manufacturer's published specifications. Assign, to the Department, all manufacturer's normal warranties or guarantees on all electronic, electrical, and mechanical equipment, materials, technical data, and products furnished for and installed on the project.

Malfunctioning equipment must be repaired or replaced at the Contractor's expense before completion of the final acceptance test plan. Furnish replacement parts for all equipment within 10 days of notification of failure by the Department.

During the warranty period, technical support must be available by telephone within 4 hr. of the time a call is made by a user, and this support must be available from factory-certified personnel.

2.21. **Training**. Conduct an installation, configuration, operation, testing, maintenance, troubleshooting, and repair training class for at least 8 hr., unless otherwise directed, for up to 10 representatives designated by the Department. Submit a training session agenda, a complete set of training material, the names and qualifications of proposed instructors, and proposed training location for approval at least 30 days before the training. Conduct training within the local area unless otherwise directed. Provide one copy of course material for each attendee. Ensure that training includes:

- hands-on operation of system software and equipment,
- explanation of all system commands and their function and use, and
- system troubleshooting and O&M.

3. CONSTRUCTION

3.1. **System Installation**. Install VDS devices and configure detection zones and settings as shown on the plans, in accordance with the manufacturer's recommendations, and as directed. Provide configuration file backups, including detector placement, names, communication settings, and output assignments. Completion of the work must present a neat, workmanlike, finished appearance. Rewiring the backplane or any other cabinet panel for the system is not permitted except for power and grounding for sensor interface panels.

VDS installer must be certified by VDS manufacturer in proper installation setup and procedures. VDS integrator must be certified by the manufacturer for training end users in the maintenance, configuration, and operation of VDS. If the VDS installer does not have VDS-manufacturer approved staff, the installer must coordinate having a VDS-manufacturer approved representative onsite the day of equipment setup and testing to ensure the system operates per the plans, and as directed.

Mount and aim detectors in a manner that eliminates, as much as possible, environmentally generated issues that limit the VDS to properly detect actual vehicles or that create false calls (e.g., glare, object obstruction, and vibration).

Provisions must be made for installation and configuration of software on Department computers.

3.2. **Temporary Use**. When shown on the plans, the VDS equipment must be used to provide vehicle detection temporarily. When the permanent vehicle detection system and related equipment are installed and made operational, the VDS equipment must be carefully removed and delivered to the location shown on the plans. 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.

3.3. **Mechanical Components**. Ensure that all fasteners, including bolts, nuts, and washers, with a diameter less than 5/8 in. are Type 316 or Type 304 stainless steel and meet ASTM F593 and ASTM F594 for corrosion resistance. Ensure that all bolts and nuts 5/8 in. and larger in diameter are galvanized and meet ASTM A307. Separate dissimilar metals with an inert dielectric material.

3.4. **Wiring**. All wiring and electrical work supplying the equipment must meet the NEC. Supply and install all wiring necessary to interconnect VDS to the controller cabinet and materials necessary to complete the work. If additional cables are required, the Contractor must furnish and install them at no additional cost to the Department. Provide conductors at least the minimum size indicated on the plans and insulated for 600 V.

All wiring must be cut to proper length and free of splices between the detector and DP. This length must include cable service loops at least at the cabinet, transition point from signal pole to mast arm, and point of attachment. All cable slack must be neatly laced and placed in the bottom of the cabinet. Ensure cables are secured with clamps.

3.5. **Electrical Service**. The Contractor is responsible for checking the local electrical service to determine whether a modification is needed for the equipment.

3.6. **Grounding**. Ensure all VDS devices and supports are grounded in accordance with the NEC and manufacturer recommendations.

3.7. **Relocation of VDS Field Equipment**. Perform the relocation in strict conformance with the requirements herein and as shown on the plans. Completion of the work must present a neat, workmanlike, finished appearance. Maintain safe construction practices during relocation.

Inspect the existing VDS field equipment with a representative from the Department, and document any evidence of damage before removal. Conduct a pre-removal test in accordance with the testing requirements contained in this Specification to document operational functionality. Remove and deliver equipment that fails inspection to the Department.

Before removal of existing VDS 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 it can be relocated. Remove existing VDS 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 power and communications, including any permits required for the work under the Contract. Provide conductors for the power connection at least the minimum size indicated on the plans and insulated for 600 V. Meet NEC requirements.

3.8. **Removal of VDS Field Equipment**. Perform the removal in strict conformance with the requirements herein and as shown on the plans. Completion of the work must present a neat, workmanlike, finished appearance. Maintain safe construction practices during removal.

Disconnect and isolate any existing electrical power supply before 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 must 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 in the General Notes. The Contractor is fully responsible for any removed equipment until released by the Engineer.

3.9. **Contractor Experience Requirements**. Contractor or designated subcontractor must meet the following experience requirements.

3.9.1. **Minimum Experience**. Three years of continuous existence offering services in VDS installation.

3.9.2. **Completed Projects**. Three completed projects in which personnel installed, tested, and integrated VDS field equipment. The completed installations must have been in continuous satisfactory operation for at least 1 yr.

3.9.3. **Equipment Experience**. One project (may be one of the three projects in Section 3.9.2., "Completed Projects") in which the personnel worked in cooperation with technical representatives of the equipment supplier to perform installation, integration, or acceptance testing of the work. The Contractor is not required to furnish equipment on this project from the same supplier that was referenced in the qualification documentation.

Submit the names, addresses, and telephone numbers of the references that can be contacted to verify the experience requirements.

4. TESTING

Ensure that the following tests are performed on equipment and systems unless otherwise shown on the plans. The Department may witness all the tests.

4.1. **Test Procedures Documentation**. Provide an electronic copy of the test procedures and blank data forms 60 days before testing for each test required on this project. Include the sequence of the tests in the procedures. The Engineer will approve test procedures before submission of equipment for tests. Conduct all tests in accordance with the approved test procedures.

Record test data and quantitative results on the data forms. Ensure the data forms are signed by an authorized representative (company official) of the equipment manufacturer.

4.2. **Design Approval Test**. Ensure that the VDS has successfully undergone a design approval test that confirms compliance with the environmental requirements of this Specification.

Provide a certification and test report from an independent testing laboratory as evidence of a successfully completed design approval test. Ensure that the testing by this laboratory is performed in accordance with this Specification.

4.3. **Demonstration Test**. Conduct a demonstration test on applicable equipment at an approved Contractor facility. Notify the Engineer 10 working days before conducting this testing. Perform the following tests.

4.3.1. **Examination of Product**. Examine each unit carefully to verify that the materials, design, construction, markings, and workmanship comply with this Specification.

4.3.2. **Continuity Tests**. Check the wiring to determine conformance with this Specification.

4.3.3. **Operational Test**. Operate each unit for at least 15 min. to permit equipment temperature stabilization and observation of enough performance characteristics to ensure compliance with this Specification.

4.4. **Stand-Alone Test**. Conduct a stand-alone test for each unit after installation. The test must exercise all stand-alone (non-network) functional operations. Notify the Engineer 5 working days before conducting this test.

4.4.1. **Performance Test**. Ensure the VDS meets functional performance requirements of Section 2.5., "Accuracy," using the following methods.

Verify presence detection accuracy at installed field sites by comparing sample data collected from the detection system to ground truth data collected by human observation. Collect samples and ground truth data for each detection zone for at least 5 min. during a peak period and 5 min. during an off-peak period.

Ensure the sample period for each zone includes at least three vehicles. Perform tests in the presence of the Engineer.

Recorded data of all sensors showing vehicle detections during a 24-hr. period at each intersection must be provided within 30 days upon request. These data must allow verification of proper sensor placement, FOV, focus, detection zone placement, and operation.

4.5. **System Integration Test**. Conduct a system integration test on the complete functional system. Demonstrate all control and monitor functions for each system component and operate the system for 72 hr. Supply two copies of the system operations manual before the system integration test. Notify the Engineer 10 working days before conducting this testing. The Department may witness all the tests. Conduct a system integration test on the complete functional system. Demonstrate all control and monitor functions for each system component for 72 hr. Supply two copies of the system operations manual before the system integration test. Notify the Engineer 10 working days before conducting this testing.

4.6. **Consequences of Test Failure**. If a unit fails a test, submit a report describing the nature of the failure and the actions taken to remedy the situation before modification or replacement of the unit. If a unit requires modification, correct the fault and then repeat the test until successfully completed. Correct minor discrepancies within 30 days of written notice to the Engineer. If a unit requires replacement, provide a new unit and then repeat the test until successfully completed. Major discrepancies that will substantially delay receipt and acceptance of the unit will be enough cause for rejection of the unit.

If a failure pattern develops in similar units within the system, implement corrective measures, including modification or replacement of units, on all similar units within the system as directed. Perform the corrective measures without additional cost or extension of the Contract period.

4.7. **Final Acceptance Test**. Conduct a final acceptance test on the complete functional system. Demonstrate all control, monitor, and communication requirements, and operate the system for 90 days. The Engineer will furnish a letter of approval stating the first day of the final acceptance test. The completion of the final acceptance test will occur when system downtime due to mechanical, electrical, or other malfunctions to equipment furnished or installed does not exceed 72 hr. and any individual points of failure identified during the test period have operated free of defects.

4.8. **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.

If, after completion of the initial test period, the system downtime exceeds 72 hr. or individual points of failure have not operated for 30 consecutive days free of defects, extend the test period by an amount of time equal to the greater of the downtime more than 72 hr. or the number of days required to complete the performance requirement of the individual point of failure.

4.9. **Relocation and Removal**.

4.9.1. **Pre-Test**. 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. Contractor must resubmit, if necessary, rejected test procedures for final approval within 10 days. Review time is in calendar days. Conduct all tests in accordance with the approved test procedures.

Conduct basic functionality testing before removal of VDS 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 will become the responsibility of the Contractor until accepted by the Department. Compare test data before removal to test data after installation. The performance test results after relocation must be equal to or better than the test results before removal. Repair or replace those components within the system that failed after relocation but passed before removal.

4.9.2. **Post-Test**. Testing of the VDS 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 VDS 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 before the day the tests are to begin. Obtain approval of test procedures before submission of equipment for tests. Send at least one copy of the data forms to the Engineer.

Conduct an approved stand-alone test of the equipment installation at the field sites. At minimum, exercise all stand-alone (non-network) functional operations of the field equipment installed per the plans as directed. Complete the approved data forms with test results and submit to the Engineer for review and either acceptance or rejection of equipment. Give at least 30 working days' notice before all tests to permit the Engineer or their representative to observe each test.

The Department will conduct approved VDS field equipment system tests on the field equipment with the central equipment. The tests will, at minimum, exercise remote control functions and confirm communication with field equipment.

If any unit fails to pass a test, prepare a report and deliver it 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

The VDS will be measured as each major system component furnished, installed, relocated, made fully operational, and tested or removed in accordance with this Special Specification or as directed.

The VDS communication cable will be measured by the foot of the appropriate media type furnished, installed, made fully operational, and tested in accordance with this Specification or other referenced Special Specifications, or as directed.

When the VDS is used temporarily, it will be measured as each system furnished, installed, and made fully operational, including reconfiguration and removal if required by the plans, and tested in accordance with this Special Specification or as directed.

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.

When recorded data are required, they will be paid for by each VDS recorded.

6. PAYMENT

6.1. **Furnish and Install**. The work performed, materials, and all accompanying software furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "VDS Processor System," "VDS Sensor Assembly" of the various types, "VDS Central Control Software," "VDS ATSPM Setup," "VDS Temporary," "VDS Cabling," and "VDS Recording." These prices are full compensation for furnishing, configuring, placing, and testing all materials and equipment, and for all tools, labor, equipment, hardware, operational software packages, supplies, support, personnel training, shop drawings, documentation, and incidentals.

These prices include all interfaces required for the field and remote communication links along with any associated peripheral equipment, including cables; all associated mounting hardware and associated field equipment; and incidentals required for a complete and fully functional video-imaging VDS.

6.2. **Install Only**. The work performed and materials furnished in accordance with this Item will be paid for at the unit price bid for "VDS Processor System (Install Only)," "VDS Sensor Assembly (Install Only)," "VDS Temporary (Install Only)," and "VDS Cabling (Install Only)." This price is full compensation for installing, configuring, integrating, and testing the completed installation, including VDS equipment, voltage converters or injectors, cables, connectors, associated equipment, and mounting hardware, and for all labor, tools, equipment, 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 price bid for "VDS Processor System (Relocate)," "VDS Sensor Assembly (Relocate)," "VDS Temporary (Relocate)," and "VDS Cabling (Relocate)." This price is full compensation for relocating and making fully operational existing equipment; furnishing and installing additional cables or connectors; testing, delivery, and storage of components designated for salvage or reuse; and all labor, tools, equipment, 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 price bid for "VDS Processor System (Remove)," "VDS Sensor Assembly (Remove)," "VDS Temporary (Remove)," and "VDS Cabling (Remove)." This price is full compensation for removing existing equipment as shown on the plans; testing, delivery, and storage of components designated for salvage; and all labor, materials, tools, equipment, and incidentals necessary to complete the work.

Special Specification 6040
Highway Traffic Signals (City of Fort Worth)

1. DESCRIPTION

Install highway 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 are in accordance with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items.

- Controller Cabinet: Attachment A City of Fort Worth Advance Transportation Controller Cabinet (ATCC) Specifications (as shown in plans or provided);
- Controller: as approved by the City of Fort Worth;
- Traffic Signal Controller Cabinet Foundations: as shown on plans;
- Item 610, “Roadway Illumination Assemblies;”
- Item 625, “Zinc-Coated Steel Wire Strand;” and
- Item 636, “Signs.”

Provide controller assemblies that are approved by the City of Fort Worth and the details shown on the plans.

Provide flasher assemblies that are approved by the City of Fort Worth and the details shown on the plans.

Sampling and testing of traffic signal controller assemblies will be done as shown in plan or as directed.

3. CONSTRUCTION

3.1. **Installation**. Install traffic signal controller foundations as shown on the plans or as directed.

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 as shown on the plans or as directed. 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 as shown on the plans or as directed. 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. **Preservation of Sod, Shrubbery, and Trees**. Replace sod, shrubbery, and trees damaged during the Contract.

3.1.4. **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.

3.1.5. **Intersection Illumination**. Install luminaires on signal poles as shown on the plans.

3.1.6. **Signal Timing Plan**. The traffic signal timing plan will be provided by the Department or local entity.

3.1.7. **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. Both the Department and the City will relieve the Contractor of maintenance responsibilities upon passing a 30-day performance test of the signal system and acceptance of the Contract.

4. MEASUREMENT

This Item will be measured as each traffic signal installed. 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."

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, 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 City of Fort Worth 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.”

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