Control	**0918-00-392**
Project	**C 918-00-392**
Highway	**VA**
County	**DALLAS**

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	**0918-00-392**
Project	**C 918-00-392**
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PROPOSAL TO THE TEXAS TRANSPORTATION COMMISSION

2024 SPECIFICATIONS

WORK CONSISTING OF INSTALL TRAFFIC SIGNAL

DALLAS 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 913 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:

NINETY THOUSAND (Dollars) **($90,000)**

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	**0918-00-392**
Project	**C 918-00-392**
Highway	**VA**
County	**DALLAS**

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.

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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	**0918-00-392**
Project	**C 918-00-392**
Highway	**VA**
County	**DALLAS**

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.				
	104	7008		REMOV CONC (MEDIANS) DOLLARS and CENTS	SY	10.000	1
	104	7011		REMOV CONC (DRIVEWAYS) DOLLARS and CENTS	SY	10.000	2
	104	7013		REMOV CONC (SIDEWALK, RAMP OR SUP) DOLLARS and CENTS	SY	10.000	3
	104	7018		REMOV CONC (CURB OR CURB & GUTTER) DOLLARS and CENTS	LF	15.000	4
	104	7046		REMOV CONC (MISC) DOLLARS and CENTS	SY	15.000	5
	162	7002		BLOCK SODDING DOLLARS and CENTS	SY	100.000	6
	168	7001		VEGETATIVE WATERING DOLLARS and CENTS	TGL	10.000	7
	361	7044		FULL-DEPTH REPAIR CRCP (VAR DEPTH) DOLLARS and CENTS	CY	2.000	8
	416	7040		DRILL SHAFT (RDWY ILL POLE) (30 IN) DOLLARS and CENTS	LF	25.000	9
	416	7043		DRILL SHAFT (TRF SIG POLE) (30 IN) DOLLARS and CENTS	LF	50.000	10
	416	7044		DRILL SHAFT (TRF SIG POLE) (36 IN) DOLLARS and CENTS	LF	150.000	11
	416	7046		DRILL SHAFT (TRF SIG POLE) (48 IN) DOLLARS and CENTS	LF	100.000	12

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	432	7001		RIPRAP (CONC)(4 IN) DOLLARS and CENTS	CY	2.000	13
	500	7001		MOBILIZATION DOLLARS and CENTS	LS	1.000	14
	502	7001		BARRICADES, SIGNS AND TRAFFIC HAN-DLING DOLLARS and CENTS	MO	30.000	15
	503	7001		PORTABLE CHANGEABLE MESSAGE SIGN DOLLARS and CENTS	DAY	50.000	16
	505	7001		TMA (STATIONARY) DOLLARS and CENTS	DAY	10.000	17
	506	7045		BIODEG EROSN CONT LOGS (INSTL) (18") DOLLARS and CENTS	LF	250.000	18
	506	7046		BIODEG EROSN CONT LOGS (REMOVE) DOLLARS and CENTS	LF	250.000	19
	529	7001		CONC CURB (TY I) DOLLARS and CENTS	LF	50.000	20
	529	7002		CONC CURB (TY II) DOLLARS and CENTS	LF	50.000	21
	529	7008		CONC CURB & GUTTER (TY I) DOLLARS and CENTS	LF	50.000	22
	529	7009		CONC CURB & GUTTER (TY II) DOLLARS and CENTS	LF	50.000	23
	531	7001		CONC SIDEWALKS (4") DOLLARS and CENTS	SY	15.000	24

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	531	7003		CONC SIDEWALKS (6") DOLLARS and CENTS	SY	50.000	25
	531	7005		CURB RAMPS (TY 1) DOLLARS and CENTS	EA	2.000	26
	531	7006		CURB RAMPS (TY 2) DOLLARS and CENTS	EA	2.000	27
	531	7007		CURB RAMPS (TY 3) DOLLARS and CENTS	EA	2.000	28
	531	7008		CURB RAMPS (TY 5) DOLLARS and CENTS	EA	2.000	29
	531	7009		CURB RAMPS (TY 6) DOLLARS and CENTS	EA	2.000	30
	531	7010		CURB RAMPS (TY 7) DOLLARS and CENTS	EA	2.000	31
	531	7011		CURB RAMPS (TY 10) DOLLARS and CENTS	EA	2.000	32
	531	7012		CURB RAMPS (TY 20) DOLLARS and CENTS	EA	2.000	33
	531	7013		CURB RAMPS (TY 21) DOLLARS and CENTS	EA	2.000	34
	531	7014		CURB RAMPS (TY 22) DOLLARS and CENTS	EA	2.000	35
	536	7001		CONC MEDIAN DOLLARS and CENTS	LF	10.000	36

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	536	7004		CONC DIRECTIONAL ISLAND DOLLARS and CENTS	SY	30.000	37
	610	7009		REMOVE RD IL ASM (TRANS-BASE) DOLLARS and CENTS	EA	1.000	38
	610	7071		IN RD IL (TY SA) 30T-4-4 (250W EQ) LED DOLLARS and CENTS	EA	1.000	39
	610	7124		IN RD IL (TY SA) 40T-8 (250W EQ) LED DOLLARS and CENTS	EA	1.000	40
	610	7196		IN RD IL (TY SA) 50T-8 (400W EQ) LED DOLLARS and CENTS	EA	1.000	41
	618	7021		CONDT (PVC) (SCH 40) (1") DOLLARS and CENTS	LF	20.000	42
	618	7022		CONDT (PVC) (SCH 40) (1") (BORE) DOLLARS and CENTS	LF	20.000	43
	618	7030		CONDT (PVC) (SCH 40) (2") DOLLARS and CENTS	LF	1,000.000	44
	618	7031		CONDT (PVC) (SCH 40) (2") (BORE) DOLLARS and CENTS	LF	500.000	45
	618	7036		CONDT (PVC) (SCH 40) (3") DOLLARS and CENTS	LF	1,000.000	46
	618	7037		CONDT (PVC) (SCH 40) (3") (BORE) DOLLARS and CENTS	LF	1,000.000	47
	618	7040		CONDT (PVC) (SCH 40) (4") DOLLARS and CENTS	LF	1,000.000	48

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	618	7041		CONDT (PVC) (SCH 40) (4") (BORE) DOLLARS and CENTS	LF	1,000.000	49
	618	7054		CONDT (PVC) (SCH 80) (2") DOLLARS and CENTS	LF	250.000	50
	618	7072		CONDT (RM) (1") DOLLARS and CENTS	LF	25.000	51
	618	7076		CONDT (RM) (1 1/2") DOLLARS and CENTS	LF	25.000	52
	618	7078		CONDT (RM) (2") DOLLARS and CENTS	LF	150.000	53
	618	7079		CONDT (RM) (2") (BORE) DOLLARS and CENTS	LF	25.000	54
	618	7082		CONDT (RM) (3") DOLLARS and CENTS	LF	75.000	55
	618	7083		CONDT (RM) (3") (BORE) DOLLARS and CENTS	LF	25.000	56
	618	7086		CONDT (RM) (4") DOLLARS and CENTS	LF	100.000	57
	618	7090		CONDUIT (PREPARE) DOLLARS and CENTS	LF	300.000	58
	620	7004		ELEC CONDR (NO.12) INSULATED DOLLARS and CENTS	LF	1,500.000	59
	620	7007		ELEC CONDR (NO.8) BARE DOLLARS and CENTS	LF	5,000.000	60

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	620	7008		ELEC CONDR (NO.8) INSULATED DOLLARS and CENTS	LF	10,000.000	61
	620	7009		ELEC CONDR (NO.6) BARE DOLLARS and CENTS	LF	2,000.000	62
	620	7010		ELEC CONDR (NO.6) INSULATED DOLLARS and CENTS	LF	2,000.000	63
	620	7011		ELEC CONDR (NO.4) BARE DOLLARS and CENTS	LF	250.000	64
	620	7012		ELEC CONDR (NO.4) INSULATED DOLLARS and CENTS	LF	250.000	65
	621	7002		TRAY CABLE (3 CONDR) (12 AWG) DOLLARS and CENTS	LF	750.000	66
	624	7001		GROUND BOX TY A (122311) DOLLARS and CENTS	EA	1.000	67
	624	7002		GROUND BOX TY A (122311)W/APRON DOLLARS and CENTS	EA	2.000	68
	624	7005		GROUND BOX TY C (162911) DOLLARS and CENTS	EA	2.000	69
	624	7006		GROUND BOX TY C (162911)W/APRON DOLLARS and CENTS	EA	4.000	70
	624	7008		GROUND BOX TY D (162922)W/APRON DOLLARS and CENTS	EA	4.000	71
	624	7012		GROUND BOX TY BATTERY (162915)W/ APRON DOLLARS and CENTS	EA	1.000	72

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	624	7013		REMOVE GROUND BOX DOLLARS and CENTS	EA	2.000	73
	625	7001		ZINC-COAT STL WIRE STRAND (3/16") DOLLARS and CENTS	LF	500.000	74
	625	7002		ZINC-COAT STL WIRE STRAND (1/4") DOLLARS and CENTS	LF	500.000	75
	625	7003		ZINC-COAT STL WIRE STRAND (5/16") DOLLARS and CENTS	LF	500.000	76
	625	7004		ZINC-COAT STL WIRE STRAND (3/8") DOLLARS and CENTS	LF	500.000	77
	627	7003		TIMBER POLE (CL 2) 40 FT DOLLARS and CENTS	EA	2.000	78
	627	7004		TIMBER POLE (CL 2) 50 FT DOLLARS and CENTS	EA	2.000	79
	628	7002		REMOVE ELECTRICAL SERVICES DOLLARS and CENTS	EA	1.000	80
	628	7188		ELC SRV TY D 120/240 070(NS)SS(E)GC(O) DOLLARS and CENTS	EA	3.000	81
	628	7189		ELC SRV TY D 120/240 070(NS)SS(E)GC(U) DOLLARS and CENTS	EA	1.000	82
	628	7190		ELC SRV TY D 120/240 070(NS)SS(E)PS(U) DOLLARS and CENTS	EA	10.000	83
	628	7191		ELC SRV TY D 120/240 070(NS)SS(E)SP(O) DOLLARS and CENTS	EA	1.000	84

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	636	7001		ALUMINUM SIGNS (TY A) DOLLARS and CENTS	SF	100.000	85
	636	7004		REPLACE EXISTING ALUMINUM SIGNS(TY A) DOLLARS and CENTS	SF	50.000	86
	644	7001		IN SM RD SN SUP&AM TY10BWG(1)SA(P) DOLLARS and CENTS	EA	10.000	87
	644	7004		IN SM RD SN SUP&AM TY10BWG(1)SA(T) DOLLARS and CENTS	EA	4.000	88
	644	7009		IN SM RD SN SUP&AM TY10BWG(1)SB(P) DOLLARS and CENTS	EA	2.000	89
	644	7012		IN SM RD SN SUP&AM TY10BWG(1)SB(T) DOLLARS and CENTS	EA	2.000	90
	644	7025		IN SM RD SN SUP&AM TYS80(1)SA(P) DOLLARS and CENTS	EA	2.000	91
	644	7028		IN SM RD SN SUP&AM TYS80(1)SA(T) DOLLARS and CENTS	EA	1.000	92
	644	7040		IN SM RD SN SUP&AM TYS80(1)SB(T) DOLLARS and CENTS	EA	1.000	93
	644	7048		IN SM RD SN SUP&AM TYS80(2)SA(P) DOLLARS and CENTS	EA	1.000	94
	644	7065		RELOCATE SM RD SN SUP&AM TY 10BWG DOLLARS and CENTS	EA	1.000	95
	644	7067		RELOCATE SM RD SN SUP&AM TY S80 DOLLARS and CENTS	EA	1.000	96

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	644	7073		REMOVE SM RD SN SUP&AM DOLLARS and CENTS	EA	4.000	97
	666	7003		REFL PAV MRK TY I (W)4"(DOT)(100MIL) DOLLARS and CENTS	LF	75.000	98
	666	7009		REFL PAV MRK TY I (W)6"(DOT)(100MIL) DOLLARS and CENTS	LF	50.000	99
	666	7015		REFL PAV MRK TY I (W)8"(BRK)(100MIL) DOLLARS and CENTS	LF	200.000	100
	666	7018		REFL PAV MRK TY I (W)8"(DOT)(100MIL) DOLLARS and CENTS	LF	50.000	101
	666	7024		REFL PAV MRK TY I (W)8"(SLD)(100MIL) DOLLARS and CENTS	LF	400.000	102
	666	7030		REFL PAV MRK TY I (W)12"(SLD)(100MIL) DOLLARS and CENTS	LF	400.000	103
	666	7036		REFL PAV MRK TY I (W)24"(SLD)(100MIL) DOLLARS and CENTS	LF	500.000	104
	666	7042		REFL PAV MRK TY I (W)(ARROW)(100MIL) DOLLARS and CENTS	EA	8.000	105
	666	7045		REFL PAV MRK TY I(W)(DBL ARROW)(100MIL) DOLLARS and CENTS	EA	1.000	106
	666	7066		REFL PAV MRK TY I (W)(WORD)(100MIL) DOLLARS and CENTS	EA	8.000	107
	666	7081		REFL PAV MRK TY I (W)(RR XING)(100MIL) DOLLARS and CENTS	EA	1.000	108

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	666	7087		REF PAV MRK TY I(W)18"(YLD TRI)(100MIL) DOLLARS and CENTS	EA	8.000	109
	666	7090		REF PAV MRK TY I(W)36"(YLD TRI)(100MIL) DOLLARS and CENTS	EA	8.000	110
	666	7108		REFL PAV MRK TY I (Y)4"(DOT)(100MIL) DOLLARS and CENTS	LF	200.000	111
	666	7111		REFL PAV MRK TY I (Y)6"(DOT)(100MIL) DOLLARS and CENTS	LF	50.000	112
	666	7114		REFL PAV MRK TY I (Y)8"(SLD)(100MIL) DOLLARS and CENTS	LF	200.000	113
	666	7117		REFL PAV MRK TY I (Y)12"(SLD)(100MIL) DOLLARS and CENTS	LF	300.000	114
	666	7123		REFL PAV MRK TY I (Y)24"(SLD)(100MIL) DOLLARS and CENTS	LF	300.000	115
	666	7204		RE PM TY II (W) (BIKE RR XING) DOLLARS and CENTS	EA	1.000	116
	666	7207		RE PM TY II (W) (BIKE DOT) DOLLARS and CENTS	EA	50.000	117
	666	7346		PAVEMENT SLER 4" DOLLARS and CENTS	LF	500.000	118
	666	7347		PAVEMENT SLER 6" DOLLARS and CENTS	LF	1,000.000	119
	666	7348		PAVEMENT SLER 8" DOLLARS and CENTS	LF	750.000	120

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	666	7350		PAVEMENT SLER 12" DOLLARS and CENTS	LF	1,000.000	121
	666	7352		PAVEMENT SLER 24" DOLLARS and CENTS	LF	1,000.000	122
	666	7353		PAVEMENT SLER (ARROW) DOLLARS and CENTS	EA	8.000	123
	666	7354		PAVEMENT SLER (WORD) DOLLARS and CENTS	EA	8.000	124
	666	7356		PAVEMENT SLER (DBL ARROW) DOLLARS and CENTS	EA	1.000	125
	666	7364		PAVEMENT SLER (RR XING) DOLLARS and CENTS	EA	1.000	126
	666	7365		PAVEMENT SLER (YLD TRI) DOLLARS and CENTS	EA	25.000	127
	666	7368		PAVEMENT SLER (BIKE ARROW) DOLLARS and CENTS	EA	2.000	128
	666	7369		PAVEMENT SLER (BIKE SYMBOL) DOLLARS and CENTS	EA	2.000	129
	666	7370		PAVEMENT SLER (BIKE WORD) DOLLARS and CENTS	EA	2.000	130
	666	7402		REFL PAV MRK TY I (W)4"(BRK)(100MIL) DOLLARS and CENTS	LF	750.000	131
	666	7405		REFL PAV MRK TY I (W)4"(SLD)(100MIL) DOLLARS and CENTS	LF	650.000	132

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	666	7408		REFL PAV MRK TY I (W)6"(BRK)(100MIL) DOLLARS and CENTS	LF	100.000	133
	666	7411		REFL PAV MRK TY I (W)6"(SLD)(100MIL) DOLLARS and CENTS	LF	800.000	134
	666	7414		REFL PAV MRK TY I (Y)4"(BRK)(100MIL) DOLLARS and CENTS	LF	50.000	135
	666	7417		REFL PAV MRK TY I (Y)4"(SLD)(100MIL) DOLLARS and CENTS	LF	750.000	136
	666	7420		REFL PAV MRK TY I (Y)6"(BRK)(100MIL) DOLLARS and CENTS	LF	50.000	137
	666	7423		REFL PAV MRK TY I (Y)6"(SLD)(100MIL) DOLLARS and CENTS	LF	100.000	138
	668	7084		PREFAB PM TY C (W)(8")(SLD) DOLLARS and CENTS	LF	50.000	139
	668	7087		PREFAB PM TY C (W)(12")(SLD) DOLLARS and CENTS	LF	500.000	140
	668	7089		PREFAB PM TY C (W)(24")(SLD) DOLLARS and CENTS	LF	500.000	141
	668	7091		PREFAB PM TY C (W)(ARROW) DOLLARS and CENTS	EA	20.000	142
	668	7093		PREFAB PM TY C (W)(DBL ARROW) DOLLARS and CENTS	EA	2.000	143
	668	7103		PREFAB PM TY C (W)(WORD) DOLLARS and CENTS	EA	20.000	144

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	668	7108		PREFAB PM TY C (W)(RR XING) DOLLARS and CENTS	EA	2.000	145
	668	7110		PREFAB PM TY C (W)(18")(YLD TRI) DOLLARS and CENTS	EA	50.000	146
	668	7111		PREFAB PM TY C (W)(36")(YLD TRI) DOLLARS and CENTS	EA	100.000	147
	668	7113		PREFAB PM TY C (W)(BIKE ARROW) DOLLARS and CENTS	EA	4.000	148
	668	7114		PREFAB PM TY C (W)(BIKE RR XING) DOLLARS and CENTS	EA	1.000	149
	668	7115		PREFAB PM TY C (W)(BIKE SYMBOL) DOLLARS and CENTS	EA	4.000	150
	668	7116		PREFAB PM TY C (W)(BIKE WORD) DOLLARS and CENTS	EA	8.000	151
	668	7117		PREFAB PM TY C (W)(BIKE DOT) DOLLARS and CENTS	EA	50.000	152
	672	7001		REFL PAV MRKR TY I-A DOLLARS and CENTS	EA	100.000	153
	672	7002		REFL PAV MRKR TY I-C DOLLARS and CENTS	EA	100.000	154
	672	7004		REFL PAV MRKR TY II-A-A DOLLARS and CENTS	EA	100.000	155
	672	7006		REFL PAV MRKR TY II-C-R DOLLARS and CENTS	EA	50.000	156

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	677	7001		ELIM EXT PM & MRKS (4") DOLLARS and CENTS	LF	300.000	157
	677	7002		ELIM EXT PM & MRKS (6") DOLLARS and CENTS	LF	100.000	158
	677	7004		ELIM EXT PM & MRKS (8") DOLLARS and CENTS	LF	70.000	159
	677	7006		ELIM EXT PM & MRKS (12") DOLLARS and CENTS	LF	50.000	160
	677	7008		ELIM EXT PM & MRKS (24") DOLLARS and CENTS	LF	100.000	161
	677	7009		ELIM EXT PM & MRKS (ARROW) DOLLARS and CENTS	EA	10.000	162
	677	7010		ELIM EXT PM & MRKS (DBL ARROW) DOLLARS and CENTS	EA	2.000	163
	677	7015		ELIM EXT PM & MRKS (WORD) DOLLARS and CENTS	EA	10.000	164
	677	7019		ELIM EXT PM & MRKS (RR XING) DOLLARS and CENTS	EA	2.000	165
	677	7023		ELIM EXT PM & MRKS (18")(YLD TRI) DOLLARS and CENTS	EA	10.000	166
	677	7024		ELIM EXT PM & MRKS (36")(YLD TRI) DOLLARS and CENTS	EA	10.000	167
	678	7001		PAV SURF PREP FOR MRK (4") DOLLARS and CENTS	LF	1,000.000	168

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	678	7002		PAV SURF PREP FOR MRK (6") DOLLARS and CENTS	LF	300.000	169
	678	7004		PAV SURF PREP FOR MRK (8") DOLLARS and CENTS	LF	300.000	170
	678	7006		PAV SURF PREP FOR MRK (12") DOLLARS and CENTS	LF	500.000	171
	678	7008		PAV SURF PREP FOR MRK (24") DOLLARS and CENTS	LF	1,500.000	172
	678	7009		PAV SURF PREP FOR MRK (ARROW) DOLLARS and CENTS	EA	35.000	173
	678	7010		PAV SURF PREP FOR MRK (DBL ARROW) DOLLARS and CENTS	EA	10.000	174
	678	7016		PAV SURF PREP FOR MRK (WORD) DOLLARS and CENTS	EA	35.000	175
	678	7020		PAV SURF PREP FOR MRK (RR XING) DOLLARS and CENTS	EA	2.000	176
	678	7022		PAV SURF PREP FOR MRK (18")(YLD TRI) DOLLARS and CENTS	EA	40.000	177
	678	7023		PAV SURF PREP FOR MRK (36")(YLD TRI) DOLLARS and CENTS	EA	50.000	178
	678	7026		PAV SURF PREP FOR MRK (BIKE ARROW) DOLLARS and CENTS	EA	4.000	179
	678	7027		PAV SURF PREP FOR MRK (BIKE RR XING) DOLLARS and CENTS	EA	1.000	180

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	678	7028		PAV SURF PREP FOR MRK (BIKE SYMBOL) DOLLARS and CENTS	EA	4.000	181
	678	7029		PAV SURF PREP FOR MRK (BIKE WORD) DOLLARS and CENTS	EA	8.000	182
	678	7030		PAV SURF PREP FOR MRK (BIKE DOT) DOLLARS and CENTS	EA	50.000	183
	678	7033		PAV SURF PREP FOR MRK (RPM) DOLLARS and CENTS	EA	100.000	184
	680	7001		INSTALL HWY TRF SIG (FLASH BEACON) DOLLARS and CENTS	EA	2.000	185
	680	7002		INSTALL HWY TRF SIG (ISOLATED) DOLLARS and CENTS	EA	15.000	186
	680	7004		REMOVING TRAFFIC SIGNALS DOLLARS and CENTS	EA	2.000	187
	682	7001		VEH SIG SEC (12")LED(GRN) DOLLARS and CENTS	EA	30.000	188
	682	7002		VEH SIG SEC (12")LED(GRN ARW) DOLLARS and CENTS	EA	10.000	189
	682	7003		VEH SIG SEC (12")LED(YEL) DOLLARS and CENTS	EA	30.000	190
	682	7004		VEH SIG SEC (12")LED(YEL ARW) DOLLARS and CENTS	EA	10.000	191
	682	7005		VEH SIG SEC (12")LED(RED) DOLLARS and CENTS	EA	30.000	192

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	682	7006		VEH SIG SEC (12")LED(RED ARW) DOLLARS and CENTS	EA	10.000	193
	682	7018		PED SIG SEC (LED)(COUNTDOWN) DOLLARS and CENTS	EA	15.000	194
	682	7035		LOUVER (12") (ADJUSTABLE) DOLLARS and CENTS	EA	4.000	195
	682	7042		BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM DOLLARS and CENTS	EA	100.000	196
	682	7043		BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM DOLLARS and CENTS	EA	25.000	197
	682	7044		BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM DOLLARS and CENTS	EA	50.000	198
	684	7031		TRF SIG CBL (TY A)(14 AWG)(5 CONDR) DOLLARS and CENTS	LF	1,000.000	199
	684	7033		TRF SIG CBL (TY A)(14 AWG)(7 CONDR) DOLLARS and CENTS	LF	1,000.000	200
	684	7035		TRF SIG CBL (TY A)(14 AWG)(9 CONDR) DOLLARS and CENTS	LF	250.000	201
	684	7036		TRF SIG CBL (TY A)(14 AWG)(10 CONDR) DOLLARS and CENTS	LF	250.000	202
	684	7038		TRF SIG CBL (TY A)(14 AWG)(12 CONDR) DOLLARS and CENTS	LF	1,000.000	203

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	684	7042		TRF SIG CBL (TY A)(14 AWG)(16 CONDR) DOLLARS and CENTS	LF	1,000.000	204
	684	7046		TRF SIG CBL (TY A)(14 AWG)(20 CONDR) DOLLARS and CENTS	LF	1,000.000	205
	684	7079		TRF SIG CBL (TY C)(12 AWG)(2 CONDR) DOLLARS and CENTS	LF	1,500.000	206
	684	7082		TRF SIG CBL (TY C)(18 AWG)(2 CONDR) DOLLARS and CENTS	LF	250.000	207
	685	7001		INSTALL RDSD FLASH BEACON ASSEMBLY DOLLARS and CENTS	EA	1.000	208
	685	7002		RELOCATE RDSD FLASH BEACON ASSEM-BLY DOLLARS and CENTS	EA	1.000	209
	685	7003		REMOVE RDSD FLASH BEACON ASSEMBLY DOLLARS and CENTS	EA	1.000	210
	685	7004		INSTL RDSD FLSH BCN ASSM (SOLAR PWRD) DOLLARS and CENTS	EA	1.000	211
	685	7005		RELOCT RDSD FLSH BCN AM (SOLAR PWRD) DOLLARS and CENTS	EA	1.000	212
	686	7006		INS TRF SIG PL AM (S)STR(TY A) DOLLARS and CENTS	EA	1.000	213
	686	7007		INS TRF SIG PL AM (S)STR(TY B) DOLLARS and CENTS	EA	1.000	214

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	686	7008		INS TRF SIG PL AM (S)STR(TY B)LUM DOLLARS and CENTS	EA	1.000	215
	686	7015		INS TRF SIG PL AM (S)STR(TY C)(32') DOLLARS and CENTS	EA	1.000	216
	686	7017		INS TRF SIG PL AM (S)STR(TY C)(36') DOLLARS and CENTS	EA	1.000	217
	686	7019		INS TRF SIG PL AM (S)STR(TY D) DOLLARS and CENTS	EA	1.000	218
	686	7020		INS TRF SIG PL AM (S)STR(TY D)LUM DOLLARS and CENTS	EA	1.000	219
	686	7025		INS TRF SIG PL AM (S)1 ARM(24') DOLLARS and CENTS	EA	1.000	220
	686	7026		INS TRF SIG PL AM(S)1 ARM(24')ILSN DOLLARS and CENTS	EA	1.000	221
	686	7027		INS TRF SIG PL AM(S)1 ARM(24')LUM DOLLARS and CENTS	EA	1.000	222
	686	7028		INS TRF SIG PL AM(S)1 ARM(24')LUM&ILSN DOLLARS and CENTS	EA	1.000	223
	686	7029		INS TRF SIG PL AM (S)1 ARM(28') DOLLARS and CENTS	EA	1.000	224
	686	7030		INS TRF SIG PL AM(S)1 ARM(28')ILSN DOLLARS and CENTS	EA	1.000	225
	686	7031		INS TRF SIG PL AM(S)1 ARM(28')LUM DOLLARS and CENTS	EA	2.000	226

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	686	7032		INS TRF SIG PL AM(S)1 ARM(28')LUM&ILSN DOLLARS and CENTS	EA	1.000	227
	686	7033		INS TRF SIG PL AM(S)1 ARM(32') DOLLARS and CENTS	EA	1.000	228
	686	7034		INS TRF SIG PL AM(S)1 ARM(32')ILSN DOLLARS and CENTS	EA	1.000	229
	686	7035		INS TRF SIG PL AM(S)1 ARM(32')LUM DOLLARS and CENTS	EA	2.000	230
	686	7036		INS TRF SIG PL AM(S)1 ARM(32')LUM&ILSN DOLLARS and CENTS	EA	1.000	231
	686	7037		INS TRF SIG PL AM(S)1 ARM(36') DOLLARS and CENTS	EA	1.000	232
	686	7038		INS TRF SIG PL AM(S)1 ARM(36')ILSN DOLLARS and CENTS	EA	1.000	233
	686	7039		INS TRF SIG PL AM(S)1 ARM(36')LUM DOLLARS and CENTS	EA	2.000	234
	686	7040		INS TRF SIG PL AM(S)1 ARM(36')LUM&ILSN DOLLARS and CENTS	EA	1.000	235
	686	7041		INS TRF SIG PL AM(S)1 ARM(40') DOLLARS and CENTS	EA	1.000	236
	686	7042		INS TRF SIG PL AM(S)1 ARM(40')ILSN DOLLARS and CENTS	EA	1.000	237
	686	7043		INS TRF SIG PL AM(S)1 ARM(40')LUM DOLLARS and CENTS	EA	2.000	238

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	686	7044		INS TRF SIG PL AM(S)1 ARM(40')LUM&ILSN DOLLARS and CENTS	EA	1.000	239
	686	7045		INS TRF SIG PL AM(S)1 ARM(44') DOLLARS and CENTS	EA	1.000	240
	686	7046		INS TRF SIG PL AM(S)1 ARM(44')ILSN DOLLARS and CENTS	EA	1.000	241
	686	7047		INS TRF SIG PL AM(S)1 ARM(44')LUM DOLLARS and CENTS	EA	2.000	242
	686	7048		INS TRF SIG PL AM(S)1 ARM(44')LUM&ILSN DOLLARS and CENTS	EA	1.000	243
	686	7049		INS TRF SIG PL AM(S)1 ARM(48') DOLLARS and CENTS	EA	1.000	244
	686	7050		INS TRF SIG PL AM(S)1 ARM(48')ILSN DOLLARS and CENTS	EA	1.000	245
	686	7051		INS TRF SIG PL AM(S)1 ARM(48')LUM DOLLARS and CENTS	EA	2.000	246
	686	7052		INS TRF SIG PL AM(S)1 ARM(48')LUM&ILSN DOLLARS and CENTS	EA	1.000	247
	686	7057		INS TRF SIG PL AM(S)1 ARM(55') DOLLARS and CENTS	EA	1.000	248
	686	7058		INS TRF SIG PL AM(S)1 ARM(55')ILSN DOLLARS and CENTS	EA	1.000	249
	686	7059		INS TRF SIG PL AM(S)1 ARM(55')LUM DOLLARS and CENTS	EA	2.000	250

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	686	7060		INS TRF SIG PL AM(S)1 ARM(55')LUM&ILSN DOLLARS and CENTS	EA	1.000	251
	686	7061		INS TRF SIG PL AM(S)1 ARM(60') DOLLARS and CENTS	EA	1.000	252
	686	7062		INS TRF SIG PL AM(S)1 ARM(60')ILSN DOLLARS and CENTS	EA	1.000	253
	686	7063		INS TRF SIG PL AM(S)1 ARM(60')LUM DOLLARS and CENTS	EA	2.000	254
	686	7064		INS TRF SIG PL AM(S)1 ARM(60')LUM&ILSN DOLLARS and CENTS	EA	1.000	255
	686	7065		INS TRF SIG PL AM(S)1 ARM(65') DOLLARS and CENTS	EA	1.000	256
	686	7066		INS TRF SIG PL AM(S)1 ARM(65')ILSN DOLLARS and CENTS	EA	1.000	257
	686	7067		INS TRF SIG PL AM(S)1 ARM(65')LUM DOLLARS and CENTS	EA	2.000	258
	686	7068		INS TRF SIG PL AM(S)1 ARM(65')LUM&ILSN DOLLARS and CENTS	EA	1.000	259
	686	7282		RELOC TRF SG PL AM(S)SNGL MST ARM POLE DOLLARS and CENTS	EA	1.000	260
	686	7283		RELOC TRF SG PL AM (S) (STRAIN POLE) DOLLARS and CENTS	EA	1.000	261
	687	7001		PED POLE ASSEMBLY DOLLARS and CENTS	EA	16.000	262

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	688	7001		PED DETECT PUSH BUTTON (APS) DOLLARS and CENTS	EA	16.000	263
	688	7003		PED DETECTOR CONTROLLER UNIT DOLLARS and CENTS	EA	4.000	264
	688	7004		VEH LP DETECT (SAWCUT) DOLLARS and CENTS	LF	200.000	265
	6006	7001		VIVDS PROSR SYS DOLLARS and CENTS	EA	1.000	266
	6006	7002		VIVDS CAM ASSY FXD LNS DOLLARS and CENTS	EA	2.000	267
	6006	7003		VIVDS CAM ASSY VAR LNS DOLLARS and CENTS	EA	2.000	268
	6006	7004		VIVDS CAM ASSY 360 DOLLARS and CENTS	EA	1.000	269
	6006	7005		VIVDS CNTRL SOFTWARE DOLLARS and CENTS	EA	1.000	270
	6006	7007		VIVDS CABLING DOLLARS and CENTS	LF	500.000	271
	6006	7010		VIVDS CAM ASSY (INSTALL ONLY) DOLLARS and CENTS	EA	5.000	272
	6006	7012		VIVDS CABLING (INSTALL ONLY) DOLLARS and CENTS	LF	1,000.000	273
	6007	7001		BBU SYSTEM (EXTERNAL BATTERY CABI-NET) DOLLARS and CENTS	EA	6.000	274

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	6007	7002		BBU SYSTEM (STAND-ALONE BATT CABINET) DOLLARS and CENTS	EA	2.000	275
	6008	7001		RVDS (PRESENCE DETECTION ONLY) DOLLARS and CENTS	EA	8.000	276
	6008	7002		RVDS (ADVANCE DETENTION ONLY) DOLLARS and CENTS	EA	2.000	277
	6008	7003		RVDS (PRESENCE AND ADVANCE DETECTION) DOLLARS and CENTS	EA	8.000	278
	6008	7004		RVDS (PRESENCE DET)(INSTALL ONLY) DOLLARS and CENTS	EA	1.000	279
	6008	7005		RVDS (ADVANCE DET)(INSTALL ONLY) DOLLARS and CENTS	EA	1.000	280
	6008	7006		RVDS (PRES AND ADV)(INSTALL ONLY) DOLLARS and CENTS	EA	1.000	281
	6008	7007		RELOCATE RVDS DOLLARS and CENTS	EA	1.000	282
	6008	7008		REMOVE RVDS DOLLARS and CENTS	EA	1.000	283
	6013	7006		GROUND BOX (PREPARE) DOLLARS and CENTS	EA	4.000	284

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.

ENGINEER SEAL

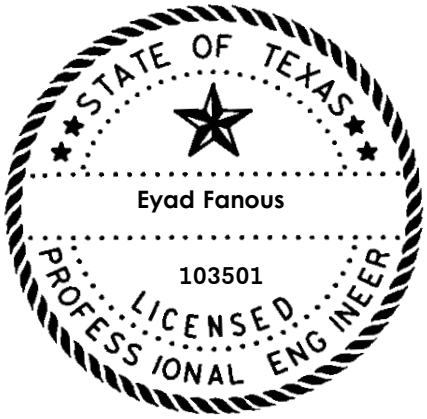
Control **0918-00-392**

Project **C 918-00-392**

Highway **VA**

County **DALLAS**

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

Eyad Fanous, P.E.

JULY 02, 2024

CSJ: 0918-00-392

County: DISTRICTWIDE

Highway: VA

GENERAL

Material On Hand will not be considered or accepted for this project.

The construction, operation and maintenance of the proposed project will be consistent with the state implementation plan as prepared by the Texas Commission on Environmental Quality.

The disturbed area for this project, as shown on the plans is 0.0858 acres. However, **the Total Disturbed Area** (TDA) will establish the required authorization for storm water discharges. The TDA of this project will be determined by the sum of the disturbed area in all project locations in the contract, and all disturbed area on all Project-Specific Locations (PSL) located in the project limits and/or within 1 mile of the project limits. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction site as shown on the plans, according to the TDA of the project. The contractor will obtain any required authorization from the TCEQ for the discharge of storm water from any PSL for construction support activities on or off of the project row according to the TDA of the project. When the TDA for the project exceeds 1 acre, provide a copy of the appropriate application of permit (NOI, or Construction Site Notice) to the engineer, for any PSL located in the project limits or within 1 mile of the project limits. Follow the directives and adhere to all requirements set forth in the TCEQ, Texas Pollution Discharge Elimination System, Construction General Permit (TPDES, CGP).

MAXIMUM TOTAL DISTURBED AREA AT ANY GIVEN TIME**				
TYPE OF SIGNALS	DISTURBED AREA*	UNIT	INTERSECTION (EA)	SUBTOTAL
TRAFFIC SIGNAL	0.0429	ACRE	2	0.0858

*PER INTERSECTION

**BASED ON 2 WORK ORDERS UNDER CONSTRUCTION

Leave all right of way areas undisturbed until actual construction is to be performed in said areas.

Provide the Engineer with a copy of all DBE subcontractor agreements prior to commencing work.

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address: https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors
or Contractor questions on this project are to be addressed to the following individual(s):

Engineer's Email: Christopher.Blain@txdot.gov
Construction Manager's Email: Eric.Herman@txdot.gov
Construction Record-Keeper's Email: Anthony.Block@txdot.gov

CSJ: 0918-00-392

County: DISTRICTWIDE

Highway: VA

All contractor questions will be reviewed by the Engineer or Construction Manager. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page.

The Letting Pre-Bid Q&A web page for each project can be accessed by using 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.

Item 1:

This is a Non-Site-Specific Contract as defined in Item 1.3.95.

Specific project locations and plan details will be incorporated into this contract by work orders at later dates.

The quantities shown on this contract are for bidding purposes only. The actual quantities will be shown on each work order.

Item 5:

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way on this project. For signal, illumination, surveillance, and communications & control maintained by TxDOT, call the TxDOT Traffic Signal Office (214-320-6682) for locates a minimum of 48 hours in advance of excavation. For irrigation systems, call TxDOT Maintenance Landscape Office (214-320-6636) for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages incurred to the above mentioned utilities when working without having the utilities located prior to excavation.

For the project to be deemed complete, permanently stabilize all unpaved disturbed areas of the project with a vegetative cover at a minimum of 70% density for the control of erosion.

Ensure a representative of the Prime Contractor is available on the project site at all times when work is being performed by the Prime Contractor or sub-contractor(s) to receive instructions from the Engineer or authorized Department representative.

Submit all shop drawings, working drawings, or other documents which require review sufficiently in advance of scheduled construction to allow no less than thirty (30) calendar days for review and response.

Locate all utilities, both underground and above ground, in the project area prior to beginning work so that conflicts are avoided.

CSJ: 0918-00-392

County: DISTRICTWIDE

Highway: VA

Provide to the Engineer, in addition to any submittals required by the specifications and elsewhere in the general notes, a list of pre-qualified material to be used on the project.

Item 7:

Repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility locates performed.

Perform all electrical work in accordance with the National Electrical Code and Texas Department of Transportation Specifications.

Consult with appropriate electric company representatives according to their respective area to coordinate electrical services installations.

Contractor will be responsible for all costs associated with locating and/or exposing existing utilities. This includes existing utilities that may have been mismarked by the locator and/or utilities that are in the near vicinity of proposed construction. In addition, this includes all costs associated with pot-holing, mechanical vacuuming, hand-digging, etc. as needed to properly locate and protect all existing utilities.

Holiday restrictions – The Engineer may decide that no lane closures or construction operations shall be allowed during the restricted periods listed in the following holiday schedule. TxDOT has the right to lengthen, shorten, or otherwise modify these restricted periods as actual, or expected, traffic conditions may warrant. Working days will not be charged for these restricted periods. No additional compensation will be allowed for these closures (i.e., overhead, delays, stand-by, barricades or any other associated cost impacts).

- New Year's Eve & Day (5 am on December 31 thru 10:00 pm January 1)
- Easter Holiday weekend (5 am on Friday thru 10:00 pm Sunday)
- Memorial Day weekend (5 am on Friday thru 10:00 pm Monday)
- Independence Day (5 am on July 3 thru 10:00 pm on July 5)
- Labor Day weekend (5 am on Friday thru 10:00 pm Monday)
- Thanksgiving Holiday (5 am on Wednesday thru 10:00 pm Sunday)
- Christmas Holiday (5 am on December 23 thru 10:00 pm December 26)

Holiday restrictions for Independence Day, Thanksgiving Holiday, and the Christmas Holiday may be extended for the "week of" due to the nature of work being performed and the work location at the discretion of the Engineer for safety of the traveling public.

Roadway closures during the following key dates and/or special events are prohibited in Navarro County.

- The University of Texas vs. University of Oklahoma football game (no lane closures beginning 4 hr. prior to the event and ending 3 hr. following event completion).

Roadway closures during the following key dates and/or special events are prohibited in Denton County.

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- The University of Texas vs. University of Oklahoma football game (no lane closures beginning 4 hr. prior to the event and ending 3 hr. following event completion).
- Texas Motor Speedway – NASCAR Series Races – April and November
- Texas Motor Speedway – INDY Series Races – June and September

The Contractor will plan his work such that no work is ongoing and all lanes of traffic are available for the NASCAR series races at the Texas Motor Speedway starting the Thursday of race week through Sunday. These races are run usually in early April and Mid-November. The Contractor will not be allowed to have any lane closures on the day of the INDY car races, one of which is usually scheduled during the beginning of June and the other is usually scheduled during Mid-September. Scheduled events at Texas Motor Speedway may be reviewed at their website: http://www.texasmotorspeedway.com. All incomplete work activities will need to be shaped up prior to the race events as to pose no hazard to traffic. The above is applicable to each year the work is ongoing. Time will not be charged on these days.

Roadway closures during the following key dates and/or special events are prohibited in Kaufman County.

- The University of Texas vs. University of Oklahoma football game (no lane closures beginning 4 hr. prior to the event and ending 3 hr. following event completion).

Roadway closures during the following key dates and/or special events are prohibited in Collin County.

- The University of Texas vs. University of Oklahoma football game (no lane closures beginning 4 hr. prior to the event and ending 3 hr. following event completion).

Roadway closures during the following key dates and/or special events are prohibited in Ellis County.

Event Restrictions – No Lane Closures that restricts or interferes with traffic will be allowed for the regional events set forth below. TxDOT has the right to lengthen, shorten, or otherwise modify these restrictions as actual traffic conditions may warrant. TxDOT also has the right to modify the list of major events as they are added, renamed, rescheduled, or as warranted.

- National Polka Festival – The event is the last weekend of every May. No lane closures will be allowed without Engineer approval for roadways in or around Ennis, Texas. Please see the event website for specific dates. www.nationalpolkafestival.com/
- Ennis Bluebonnet Trails Festival – The event is the month of April. No lanes closures on the various Farm-to-Market roadways will be allowed without

Engineer approval. The roadways vary each year. Please see the event website for a current map and list of roadways. https://www.visitennis.org/bluebonnet.htm

- Texas Motorplex - The are several major events held including the Spring, Summer, and Fall NHRA Nationals. These events affect US-287 (between Ennis and Waxahachie). No lane closures will be allowed without Engineer approval. Please visit the Texas Motorplex website for current schedule for specific dates and times. www.texasmotorplex.com
- Scarborough Renaissance Festival – Waxahachie, Texas – The event is every weekend (Saturday and Sunday) during the months of April and May. The event affects IH-35E northbound and southbound between mile markers 397 – 402 and FM-66. No lane closures will be allowed without Engineer approval. Additional information may be found on the events website. www.srfestival.com
- The University of Texas vs. University of Oklahoma football game (no lane closures beginning 4 hr. prior to the event and ending 3 hr. following event completion).

Roadway closures during the following key dates and/or special events are prohibited in Dallas County.

Event Restrictions – No Lane Closures that restricts or interferes with traffic will be allowed for the regional events set forth below. This affects IH30, IH30 HOV, IH35E, IH35E HOV, IH45, IH345, SH352, and SS366. TxDOT has the right to lengthen, shorten, or otherwise modify these restrictions as actual traffic conditions may warrant. TxDOT also has the right to modify the list of major events as they are added, renamed, rescheduled, or as warranted.

- State Fair of Texas (no lane closures after 6 A.M. on Fridays through 9 P.M. on Sundays; no full closures for any direction of any facility from opening day through the closing day).
- The University of Texas vs. University of Oklahoma football game (no lane closures beginning 4 hr. prior to the event and ending 3 hr. following event completion).
- The First Responder Bowl (no lane closures beginning 3 hr. prior to the event and ending 2 hr. following the event completion).
- Dallas Mavericks Home Games (no lane closure beginning 2 hr. prior to the event and ending ½ hr. following event commencement with no full lane closures considered until 2 hr. following event completion).
- Dallas Stars Home Games (no lane closure beginning 2 hr. prior to the event and ending ½ hr. following event commencement with no full lane closures considered until 2 hr. following event completion).
- Texas Rangers Home Games (no lane closure beginning 2 hr. prior to the event and ending ½ hr. following event commencement with no full lane closures considered until 2 hr. following event completion).
- Dallas Cowboys Home Games (no lane closure beginning 2 hr. prior to the event and ending ½ hr. following event commencement with no full lane closures considered until 2 hr. following event completion).
- Major Events at the American Airline Center, Globe Life Park in Arlington, AT&T Stadium with expected attendance exceeding 15,000 (no lane closures beginning

2 hr. prior to event and ending ½ hr. following event commencement with no full closures considered until 2 hr. following event completion).

- Major Downtown Dallas Events (restrictions will be considered on a case-by-case basis). This category could include, but is not limited to, parades for sports championships, major political events, major Art District Events, and large athletic events such as marathons.

Item 8:

This project charges by Calendar Days in accordance with Article 8.3.1.5 and the work orders will be based on a Standard Workweek in accordance with Article 8.3.1.4. Multiple work orders may be issued concurrently. Provide suitable machinery, equipment, and construction forces for the proper prosecution of the work. The construction forces shall be able to complete 2 work orders simultaneously. In addition, if extended periods of time are anticipated between issuance of work orders to the Contractor, time charges may be suspended by the Engineer.

The response time specified in this contract is an essential element. Liquidated damages will be assessed when the Contractor fails to begin work within the specified response time for any work order. The dollar amount specified in this contract will be deducted from any money due or to become due for any work order and will continue to be deducted for each day until work begins. This amount will be assessed not as a penalty, but as liquidated damages.

A 90 day construction delay is included in this contract through Special Provision 008-005. This delay is included for material acquisition for the initial work order on the project.

Item 162:

Install block sod as directed by the Engineer.

Item 168:

Water once a day where sod is installed. Include cost for this work in the unit bid price for this item.

Item 361:

The removal of any raised medians or islands dowelled on top of concrete repair sections will be considered subsidiary to Item 361.

Item 416:

Drilled shafts shall be drilled and poured on the same day unless directed by the engineer.

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Provide a formed smooth finish for all portions of drill shafts extending above proposed ground. Include cost for this work in the unit bid price for this item.

Traffic signal pole and/or illumination pole foundations will be paid for once regardless of extra work caused by obstructions.

Concrete removal required for installation of drilled shafts will be subsidiary to Item 416.

Item 421:

Furnish mix designs to the Engineer in a format compatible to the latest version of the Department's Construction Management System (SiteManager). Mix Design templates will be provided by the Engineer.

Provide sulfate resistant concrete for all drilled shafts.

Provide all freshly mixed concrete testing equipment as required by subsection 3.3, except as noted here. Curing facilities, maturity meters, and strength-testing equipment will not be required. Air content testing is waived for this project. All testing equipment shall be clean and in like-new condition. Test molds shall be 4" diameter x 8" tall.

Items 440:

Fiber Reinforced Concrete (FRC) can be used as a substitute for Non-Structural Class Reinforced Concrete in Mow-Strip and Rip Rap Items as approved. FRC may also be used for other Non-Structural Class Reinforced Concrete Items as approved.

Item 449:

Use Thomas & Betts Kopr-Shield, MG Chemicals #846, MG Chemicals #8463, NYOGEL #756G, Pro-Shield #7308, Cho-Lube #4220, or other approved electrically conducting lubricant compound.

Item 502:

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 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.

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or base in turning movements to accommodate and to protect the traffic from edge drop-offs. Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

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Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Do not commence work on the road before sunrise. Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

Payment for Item 502-7001 will be prorated on a daily basis based on the number of days worked during the month with traffic control in place. This item will not be paid when working days have been suspended between work orders. In addition, when work is not being performed and/or traffic control is not in place, this item will not be paid.

When moving unlicensed equipment on or across any pavement or public highways, protect the pavement from all damage using an acceptable method.

Limit lane closures along to the hours between 9:00 am and 3:30 pm. Work in other areas of the project is not restricted to this time frame.

Item 505:

The total number of truck mounted attenuators (TMA) required when utilizing the traffic control standards are shown in the tables below.

TCP 2 Series	Scenario		Required TMA/TA	
(2-1)-18 / (2-2)-18 / (2-4)-18 / (2-5)-18 / (2-6)-18	All		1	
(2-3)-18	A	B	1	2

WZ (BTS) Series	Scenario	Required TMA
(BTS-1)-13	Near Side Lane Closure	1

Shadow vehicles equipped for truck mounted attenuators (TMA) for stationary operations will be paid for by the day and must be available for use at any time as determined by the Engineer.

Therefore, 1 total shadow vehicle with TMA will be required for this type of work. The contractor will be responsible for determining 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 for those times per plan requirements. Additional TMAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.

Item 506:

Install Biodegradable Erosion Control Logs as directed by the Engineer.

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Item 529:

Provide grooved joints at 10-foot intervals and ¾ inch expansion joint material for doweled curb at the same locations as on the existing pavement.

For Curb and Gutter sections, provide grooved joints at 10-foot intervals and ¾ inch expansion joint material at a maximum of 50-foot centers and at all radius points and inlets.

Curb and Gutter transitions will be paid for by the foot at the unit price for the corresponding curb or curb and gutter section.

Saw joints at the same location as on the existing pavement.

Item 531:

Joint Sealing is subsidiary to Item 531.

Item 610:

The luminaire arm and fixture shall be delivered to the District Signal Shop if they are not needed on the work order plan.

When luminaire poles are used for signal or pedestrian heads at an intersection, provide 12 circuit Buchanan Type 112SN, Kulka Type 985-GP-10 CU, or equal terminal strip in the luminaire pole access compartment. The conductors for the line and load side of the terminal strip shall be identified with a plastic label with two straps per tag. The load side shall have each signal head and ped head identified on the tag.

Item 618:

Place conduit under railroad tracks to maintain a minimum of 42" below the bottom of the ties.

The location of conduits and ground boxes are diagrammatic only and may be shifted to accommodate field conditions as directed.

Secure permission and approval from the proper authority prior to cutting into or removing any sidewalks or curbs for installation of this Item.

When holes are drilled through concrete structures, use a coring device. Do not use masonry or concrete drills.

Structurally mount junction boxes as shown on the plans. When used for traffic signal installations, use boxes 12"x12"x8", or as approved.

Use conduit hangers for 3 inch and larger conduit when hanging conduit from structures.

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Place conduit under existing pavement by an approved boring method. Do not place boring pits closer than 2 feet from the edge of the pavement unless otherwise directed. Do not use water jetting. When conduits are bored, do not exceed 18 inches in the vertical and horizontal tolerances as measured from the intended target point.

Do not use a pneumatically driven device for punching holes beneath the pavement (commonly known as a "missile").

Furnish and install a flat, high tensile strength polyester fiber pull tape in conduit runs in excess of 50 feet or for future use and protected with standard weather-tight conduit caps, as approved. Acceptable products include Garvin # PT-1250-3K, ComStar PUL 1250P3K, Ideal Part No. 31-315 or equal as approved by the Engineer. This work will not be paid for directly, but is subsidiary to this Item.

Use a colored cleaner-primer on all PVC to PVC joints before application of PVC cement.

Seal all conduit ends with a permanently soft, non-toxic duct seal. Use a duct seal that does not adversely affect other plastic materials or corrode metals.

If existing conduit is proposed for reuse in this project, conduit prep will be paid for under this item.

When using existing conduit, ensure that all conduits have bushings and are cleaned of mud and debris. Restrap conduit that is being relocated to new timber poles as if it were a new installation. This work will not be paid for directly, but is subsidiary to this Item.

Where sidewalk is removed to install trenched conduit, replace sidewalk to match existing material. This work will be subsidiary to Item 618 except where shown otherwise in the plans.

For projects in the City of Denton, where two conduits are shown to be installed between ground boxes, these conduits shall be parallel and bored separately. Install cables and conductors of 120 V equipment through one conduit and low voltage equipment in the other conduit. Avoid crossing high and low voltage cables in ground boxes where possible.

2” Schedule 80 PVC will be used at the power pole to supply electricity to underground services.

Item 620:

The equipment grounding conductor shall be identified by a continuous green colored jacket insulation or bare wire. Grounded conductors (Neutral) shall be identified by a continuous white colored jacket. Ungrounded conductors (Hot) in a 120/240v system shall be identified by each pole or leg. For 240-volt branch circuit fed from 120/240

source, ensure one leg is identified by a continuous black colored jacket and the other leg by a continuous red colored jacket.

Item 624:

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.

Item 627:

Use the timber pole heights, as shown on the plans and in the material summary, for bidding purposes only. Coordinate pole locations, and make field measurements before construction to ensure a vertical clearance of 17 to 19 feet from the highest point on the roadway surface to the span. Except for supplemental nearside signal heads, all signal heads must be installed at least 40' from the stop line. If field adjustments result in the nearest signal head being more than 180' from the stop line, install a supplemental nearside signal head as directed by the engineer. Determine the field measurements and elevations from the actual field location of the poles, considering all above and below ground utilities and existing roadway elevations.

Weather heads, grounding equipment, 8-foot luminaire arms for mounting on timber poles, and concrete backfill (when required) shall not be paid for directly, but will be considered subsidiary to this Item.

Item 628:

Contact the appropriate utility company during the first three weeks of the project lead-time period to allow adequate time for any necessary utility adjustments, transformer installation, etc.

Contractor shall submit an online request at ONCOR.com by following the steps below:
Select Construction and Development tab at top of screen.
Scroll down to Request New Service under New Construction Portals.
Select the Start Request icon under the Commercial and Industrial project type.
Select the One Single Building Facility tab and fill in all required information, including TxDOT, the project name, and CSJ in the Additional Comments box.
Submit the request. An ONCOR representative will respond to the request within a few days with a Work Order Number and the ONCOR designer contact information.

Granite concrete service pole embedment depth shall be 10' and shall be a minimum of 25' above grade.

Backfill Granite Concrete service poles with a Class A concrete in accordance with Item 421, "Hydraulic Cement Concrete", except consider the concrete subsidiary to Item 628 for payment purposes.

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The Meter Base or Transocket shall be mounted facing the roadway and the service enclosure shall be mounted on the opposite side of the service pole or pedestal.

Label the service enclosures indicating service address as well as all required information as shown on the Electrical Detail (ED) standard sheets. Labeling shall be silk screening or other acceptable method. This work will not be paid for directly, but is subsidiary to this Item.

A Licensed Master Electrician shall oversee the installation of all electrical services.

Bill the electrical service power usage to the Texas Department of Transportation, unless otherwise directed, or noted on the Work Order plans.

On the outside lower front of each electrical service meter base cover, install a 12-gauge minimum thickness stainless steel, aluminum, or brass placard. The placard shall be engraved or stamped with the numeric portion of the street address and permanently affixed to the cover with exterior rated adhesive so as not to interfere with the operation of the latch. This work will not be paid for directly, but is subsidiary to this Item.

For work orders in the City of Dallas for non-controlled access locations the Contractor will be responsible for the following:

1. Prior to application for electrical service connection, the Contractor shall apply for an electrical service permit at 320 E. Jefferson Street in Dallas and have the new electrical service inspected and “green-tagged” at their expense. The Contractor shall apply for inspection of the installed electrical service infrastructure by the utility company, and shall coordinate the installation of underground cable by the utility company. The Contractor shall notify City of Dallas Traffic Signal staff with regular updates about information relevant to setting up electric service accounts for the project.
2. Upon receipt of “green tag” and after underground cable is installed by the utility company for each location, the Contractor shall provide a copy of the “green tag” to Mr. Alfred Lemon and Mr. Favian Giraldo at the City of Dallas Signal Shop. The City shall submit the request for new electric service to the utility provider upon receipt of a copy of the “green tag”. Electrical service accounts for each new electrical service shall be established by and billed to the City of Dallas.

Item 644:

Prior to taking elevations to determine lengths for fabrication of sign posts, obtain verification of all proposed locations.

All sign mounts shall have a clamp base system for all small roadside sign assemblies.

A 3 inch strip of red reflective sheeting shall be placed on all Do Not Enter sign assemblies. This sheeting shall be placed directly below the Do Not Enter sign for the entire length of the sign post facing wrong way traffic. This work will be considered subsidiary to Item 644.

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Item 656:

Before placing the concrete for the controller foundation, coordinate with the appropriate City as needed to ensure that the anchor bolt spacing will match the anchor bolts and cabinet supplied by the city.

Form a 3/4-inch chamfer on the top edge of each pedestal pole foundation.

Probe for utilities and underground structures prior to drilling foundations. Foundations shall be paid for once regardless of extra work caused by obstructions.

Item 662 and 672:

Black adhesive will be used on asphalt pavements and white adhesive will be used on concrete pavements.

Item 677:

A water blasting method approved by the Engineer will be the only method allowed for the removal of permanent and temporary pavement markings except on a sealcoat surface. A 2 foot wide sealcoat will be required on sealcoat surfaces to eliminate permanent and temporary pavement markings.

Item 680:

Requirements for this Item include the following work, all of which are subsidiary to this Item:

1. Notify the Traffic Projects Office at DAL_TPO@txdot.gov one week before beginning any work involving traffic signals. Supplement email correspondence with the District Signal Maintenance Office at (214)320-6682 and Construction Office at (214)319-6406.
2. Provide submittal literature for all traffic signal equipment before installation.
3. Furnish and install a new controller (eight phase NEMA TS 2 Type 1) and cabinet (NEMA TS 2 Size 6, 16 position load bay), meeting the requirements of Departmental Materials Specifications DMS-11170. Provide detector panel toggle switches that additionally permit the user to disconnect the detector. Provide new MMU with Ethernet port. For a pole-mount controller, provide three mounting brackets and install a 5' x 5' x 4" Class A concrete pad under the cabinet in accordance with Items 420 and 421.
4. If the signal controller and cabinet are to be supplied by the City specified on a Work Order, pick up and install the City supplied equipment as shown on the Work Order. For Work Orders which specify a City supplied controller and cabinet, the Contractor furnished controller and cabinet shall be delivered to the TxDOT Dallas District Office.
5. Deliver the cabinet, controller, and accessories (with all cabinet components completely connected and securely strapped down) to the District Signal Shop, 4777

E Hwy 80, Mesquite, for testing. Notify the District Signal Shop two working days before delivery at (214)320-6682.

6. If the Work Order requires conventional loop detection, provide detector cards that have a Liquid Crystal Display (LCD) of all operational and diagnostic information. The LCD shall show all major parameters of the loop operation including loop frequency, loop inductance, inductance change, and loop faults. Loop faults include open circuit, short circuit, and inductance change. Provide a user's manual with full operating instructions and the contact name, address, and telephone number for the representative, manufacturer, or distributor for warranty repair. Submit a copy of a test report certified by an independent laboratory that the detector unit model submitted meets NEMA TS1 requirements.
7. Install the controller cabinet in an orientation as directed.
8. Connect all field wiring to the controller assembly. The City or District will assist in determining how the detection cables are to be connected, and will also program the controller for operation, hook up the malfunction management unit (MMU) or conflict monitor, detector units, and other equipment, and turn on the controller. Pick up the signal cabinet from the City or District Signal Shop. Have a qualified technician and a representative from the controller supplier on the project site to place the traffic signals in operation.
9. Furnish and install all Contractor supplied sign panels for mounting on signal poles, mast arms, and span wires. Fabricate the sign panels in accordance with Item 636, and mount with Astro-Sign Brac, Signfix aluminum channel, or equal as approved by the Engineer. Submit five (5) sets of shop drawings for street name signs. Pick up and install all City supplied sign panels or ILSN signs for mounting on signal poles, mast arms, and span wires. Furnish all mounting hardware for all signs except ILSN signs
10. Provide 250W Equivalent LED Fixtures with 120 – 277 volt electronic LED drivers as shown on the Material Producers List.
11. Remove the existing stop sign panels or assemblies after the traffic signals are in operation.
12. Install the emergency vehicle preemption equipment supplied by the City as shown on each individual work order.
13. Use qualified personnel to respond to and diagnose all trouble calls during the thirty-day test period. Repair any malfunction to Contractor-supplied signal equipment. Provide to the Engineer a local telephone number, not subject to frequent changes and available on a 24-hour basis, for reporting trouble calls. Response time to reported calls must be less than 2 hours. Make appropriate repairs within 24 hours. Place a logbook in the controller cabinet and keep a record of each trouble call reported. Notify the Engineer of each trouble call. Do not clear the error log in the conflict monitor or MMU during the thirty-day test period without approval.
14. Prevent any damage to property owner's poles, fences, shrubs, mailboxes, etc. Protect all underground and overhead utilities and repair any damage. Provide access to all driveways during construction.
15. Integrate the proposed traffic signal(s) into the existing closed loop system as shown on the plans. CENTRACS closed loop software, which utilizes Econolite Cobalt controllers, is currently in use in the Dallas District. Provide controllers on this project that fully communicate with the existing closed loop system.

16. The concrete foundation for the controller as shown on standard TS-CF is diagrammatic and the dimensions will be adjusted in the field to fit existing conditions.
17. Salvage the existing traffic signals as shown on the work order plans. Salvage poles, cabinets, service poles, and any other equipment as directed. This equipment remains the property of the Texas Department of Transportation or the City specified in the Work Order. The material listed above shall be stockpiled at the TxDOT District Signal Shop, 4777 E Hwy 80, Building N, Mesquite, Tx 75150 or location designated in the work order as directed. Contact the District Signal Shop at 214-320-6682 48 hours in advance of delivery of TxDOT material. All other material removed in this project will become the property of the Contractor. Dispose of material off the right of way in accordance with federal, state, and local regulations. Maintain the operation of the existing traffic signal until directed to remove it.

Item 682:

Install signal head attachments so that the wiring to each signal head passes from the mast arm through the attachment hardware to the signal head. Do not leave cable or wiring exposed.

Provide signal head attachments that allow for adjustment about the horizontal and vertical axis.

Unless otherwise shown on work order plans, provide aluminum pedestrian and vehicle signal heads in the following color: Federal Yellow #13538 of Federal Standard 595. Provide non-painted aluminum tubing. Provide back plates, louvers, and the inside of visors with a flat black finish. Provide aluminum vented retroreflective back plates for all traffic signal heads.

Turn down signal heads or cover with burlap or other material, as approved, until traffic signal is placed in operation.

Mount signal heads level and plumb and aim as directed.

Provide louvers that have 5 vanes and a flat black finish on the inside surfaces. Securely fasten a hardware cloth screen with 5/8 inch or smaller mesh size to the front face of each louver to prevent entry by birds.

Item 684:

Provide 18 AWG Type C signal cables for loop detector lead-ins.

Provide stranded 14 AWG Type A signal cables for LED signal heads and stranded 12 AWG Type C cables for APS units.

Provide a separate multi-conductor signal cable (14 AWG) inside pedestal poles and signal poles from the terminal strip to each signal head as shown on the plans.

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Identify each cable as shown on the plans (cable 1, etc.) with permanent marking labels (Panduit Type PLM standard single marker tie, Thomas&Betts Type 548M, or equal) at each ground box, pole base, and controller.

Item 685:

For non-timed installations, such as “Signal Ahead” flasher, a solid-state time clock will not be required in the flasher controller assembly.

Item 686:

Provide 12 circuit Buchanan Type 112SN, Kulka Type 985-GP-12 CU, or equal terminal strips in the signal pole access compartment. Provide additional terminal strips of 8 circuits each when more than 12 circuits are required. The conductors for the line and load side of the terminal strip shall be identified with a plastic label with two straps per tag. The load side shall have each signal head and ped head identified on the tag.

Mark pole shafts and mast arms with the identification numbers from the plans to facilitate field-assembly. Identify pole shafts and mast arms by intersection for projects with multiple intersections.

Provide nuts on top and bottom (double nuts) of the base plate as shown on the plans.

Set anchor bolts for mast arm signal poles and strain poles so that two are in tension and two are in compression. Obtain approval of anchor bolt placement before placing concrete.

Provide vertical clearance of 17 to 19 feet from the roadway to the lowest point of the signal head or mast arm. Except for supplemental nearside signal heads, all signal heads must be installed at least 40’ from the stop line. If field adjustments result in the nearest signal head being more than 180’ from the stop line, install a supplemental nearside signal head as directed by the engineer. Determine the field measurements and elevations from the actual field location of the poles, considering all above and below ground utilities and existing roadway elevations.

Provide vibration dampers for mast arms 28 feet to 48 feet in length. Install as shown on MA-DPD.

For mast arm poles designated with an ILSN bid code, the ILSN arm, clamps, bolts, and washers will be considered part of the complete pole assembly. The ILSN signs and mounting hardware will be furnished by the applicable City.

The bid price for this item is for a standard galvanized signal pole. If a City requests powder coating on signal poles, The City will pay the Contractor directly for powder coating and all associated costs. The Contractor shall coordinate with the City to collect this payment. Contact the City for further information. Powder coating must meet the requirements of the City.

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For existing signal poles, replacement of existing conductors is not required inside the poles. Plug any unused openings in existing mast arms and poles with an approved material.

Provide 3 pipe plugs for wiring access on strain poles.

Provide a three piece bracket assembly on strain poles or drill the pole and use thimble eye bolts to attach the strain vise for the span wire.

Item 687:

The bid price for this item is for a standard galvanized pedestal pole. If a City requests powder coating on pedestal poles, The City of will pay the Contractor directly for powder coating and all associated costs. The Contractor shall coordinate with the City to collect this payment. Contact the City for further information. Powder coating must meet the requirements of the City.

Provide 12 circuit Buchanan Type 112SN, Kulka Type 985-GP-10 CU, or equal terminal strip in the pedestal pole base. The conductors for the line and load side of the terminal strip shall be identified with a plastic label with two straps per tag. The load side shall have each signal head and ped head identified on the tag.

Item 688:

Maintain a minimum 12 inch separation between loop lead-in sawcuts and loop sawcuts, and a minimum 6 inch separation between loop lead-in sawcuts and other loop lead-in sawcuts.

Use loop wire for concrete pavement and loop duct for asphalt pavements.

Install loop detectors only during off-peak traffic periods.

Verify the locations of the APS units or push button assemblies and the direction of the arrows on the signs prior to installation.

Contractor shall provide a digital copy of the APS messages to TxDOT for all new APS Units on the project.

APS Units shall operate with hardwired connections for the communications path between the APS Units and the APS controller.

Assist the Engineer in determining the loop inductance of each loop detector installation. In the presence of the engineer, conduct field testing to determine the total inductance of the loop detector and the percentage shift in loop inductance for various size vehicles.

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Item 6006:

Install the Video Processor System so that it interfaces with the traffic controller unit (CU) via the detector rack. If the manufacturer does not have a product to interface via the detector rack, interface via SDLC.

For each work order containing this bid item provide spare VIVDS equipment consisting of one additional camera, paid for by bid item, and one additional VIVDS detector rack card, subsidiary to the Video Processor System bid item. Deliver spare equipment to District Signal Shop at 4777 E Hwy 80, Mesquite, Tx, 75150.

If the camera locations shown in the plans do not allow for proper sight of the proposed detection zones, relocate the cameras as needed and as directed. This labor and material cost will not be paid separately, but is subsidiary to these items.

Item 6007:

If the BBU is side-mounted, the BBU will be installed with the controller on the concrete pad paid for under Item 680. If a larger pad is needed to accommodate the BBU, the additional labor and material will be subsidiary to this item.

If the BBU will be furnished by the City specified on the Work Order, pick up and install the City supplied BBU as shown on the Work Order. For such cases, the Contractor furnished BBU shall be delivered to the District Signal Shop.

Item 6008:

For the first Work Order that specifies Stop Bar Presence Radar and/or Set Back Advance Radar, provide 8 hours of operational and maintenance training for all brands of radar provided on this project to designated personnel. Provide this training for a maximum of 12 people, at a time and location approved by the Engineer. Provide training which includes, but not limited to “hands-on” operation for each type of equipment; explanation of all system commands, function, and usage; required preventative maintenance procedure; and system “trouble-shooting” or problem identification. Submit an outline of the proposed training material for approval at least 60 days before the training begins.

Relocation of sensors and all additional items such as poles, conduit, cable, etc. required to achieve the detection specified in the plans will not be paid for separately, but will be considered subsidiary to this item.

Item 6013:

If existing ground boxes are proposed for reuse in this project, ground box prep will be paid for under this item.

CSJ: 0918-00-392

County: DISTRICTWIDE

Highway: VA

The list of material below is for the Contractor's information only.
It is the responsibility of the Contractor to verify
all items and quantities listed below.

LIST OF MATERIAL
FURNISHED BY CITY (SPECIFIED IN EACH WORK ORDER)

EQUIPMENT FURNISHED BY CITY		
DESCRIPTION	UNIT	QUANTITY
CONTROLLER, CABINET AND ACCESSORIES	EA	1
OPTICOM EQUIPMENT	LS	1
BBU	EA	1
STREET NAME SIGNS	EA	*

*AS SHOWN IN WORK ORDER PLAN

LIST OF MATERIAL
SUBSIDIARY TO ITEM 680 (FLASHING BEACON)

ITEM 680-6001 FLASHING BEACON BREAKDOWN PER INTERSECTION (SPECIFIED IN EACH WORK ORDER)		
DESCRIPTION	UNIT	QUANTITY
FLASHING BEACON CONTROLLER/CABINET	EA	1
SIGNS (REGULATORY AND STREET NAME)	EA	*
5'X5'X4" CONCRETE PAD FOR POLE MOUNTED CABINET (CLASS A)	CY	0.31
250W EQUIVALENT LED LUMINAIRE	EA	*

*AS SHOWN IN WORK ORDER PLAN

CSJ: 0918-00-392

County: DISTRICTWIDE

Highway: VA

LIST OF MATERIAL/LABOR

SUBSIDIARY TO ITEM 680 (ISOLATED)

ITEM 680-6002 BREAKDOWN PER INTERSECTION (SPECIFIED IN EACH WORK ORDER)		
DESCRIPTION	UNIT	QUANTITY
TRAFFIC CONTROLLER, CABINET & ACCESSORIES	EA	1
5/8" X 8 LF COPPERCLAD GROUND ROD W/CLAMP	EA	1
INSTALL EQUIPMENT SUPPLIED BY CITY	LS	1
SIGNS (REGULATORY AND STREET NAME)	EA	*
REMOVE SIGN PANELS	EA	*
8'X9'X6" TRAFFIC SIGNAL CONTROLLER FOUNDATION (BASE MOUNT) (CLASS B)	CY	1.3
TRAFFIC SIGNAL CONTROLLER BASE	EA	1
5'X5'X4" CONCRETE PAD FOR POLE MOUNT CABINET (CLASS A)	CY	0.31
2 CHANNEL DETECTOR CARDS	EA	*
DETECTOR CARD RACK	EA	*
250W EQUIVALENT LED LUMINAIRE	EA	*
WIRE THE CABINET AND ACCESSORIES	LS	1

*AS SHOWN IN WORK ORDER PLAN

CONTROL : 0918-00-392
PROJECT : C 918-00-392
HIGHWAY : VA
COUNTY : DALLAS

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 104 REMOVING CONCRETE
ITEM 162 SODDING FOR EROSION CONTROL <164><166><168>
ITEM 168 VEGETATIVE WATERING
ITEM 361 FULL-DEPTH REPAIR OF CONCRETE PAVEMENT <360><421><440>
ITEM 416 DRILLED SHAFT FOUNDATIONS <405><420><421><423><440><448>
ITEM 432 RIPRAP <247><420><421><431><440>
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 529 CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER <360> <420><421><440>
ITEM 531 SIDEWALKS <104><360><420><421><440><530>
ITEM 536 CONCRETE MEDIANS AND DIRECTIONAL ISLANDS <420><421><427> <440><529>
ITEM 610 ROADWAY ILLUMINATION POLE ASSEMBLIES <416><421><432><441> <442><445><449><616><618><620><622><624><628>
ITEM 618 CONDUIT <400><445><476>
ITEM 620 ELECTRICAL CONDUCTORS <610><628>
ITEM 621 TRAY CABLE <620>
ITEM 624 GROUND BOXES <420><421><432><440><618><620>
ITEM 625 ZINC-COATED STEEL WIRE STRAND
ITEM 627 TREATED TIMBER POLES
ITEM 628 ELECTRICAL SERVICES <441><445><449><618><620><627><656>
ITEM 636 SIGNS
ITEM 644 SMALL ROADSIDE SIGN ASSEMBLIES <421><440><441><442><445> <636><656>

ITEM 666 RETROREFLECTORIZED PAVEMENT MARKINGS <316><502><662><667> <677><678><6438>
ITEM 668 PREFABRICATED PAVEMENT MARKINGS AND RUMBLE STRIPS <678>
ITEM 672 RAISED PAVEMENT MARKERS <677><678>
ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS <300> <302><315><316>
ITEM 678 PAVEMENT SURFACE PREPARATION FOR MARKINGS <677>
ITEM 680 HIGHWAY TRAFFIC SIGNALS <416><450><531><610><618><620> <621><624><625><628><636><656><682><684><686><687><688>
ITEM 682 VEHICLE AND PEDESTRIAN SIGNAL HEADS
ITEM 684 TRAFFIC SIGNAL CABLES <625><680><690>
ITEM 685 ROADSIDE FLASHING BEACON ASSEMBLIES <441><442><445><449> <618><620><621><622><624><628><636><656><682><684><687>
ITEM 686 TRAFFIC SIGNAL POLE ASSEMBLIES (STEEL) <416><421><441> <442><445><449>
ITEM 687 PEDESTAL POLE ASSEMBLIES <445><449><656><682><688>
ITEM 688 PEDESTRIAN DETECTORS AND VEHICLE LOOP DETECTORS <618> <624><682><684>

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

SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000---005)
SPECIAL PROVISION "NONDISCRIMINATION" (000---001)
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 "SMALL BUSINESS ENTERPRISE IN STATEFUNDED PROJECTS" (000---019)
SPECIAL PROVISION TO ITEM 8 (008---005)

SPECIAL SPECIFICATIONS:

ITEM 6006 VIDEO IMAGING VEHICLE DETECTION SYSTEM
ITEM 6007 BATTERY BACK-UP SYSTEM FOR SIGNAL CABINETS <420><620>
ITEM 6008 RADAR VEHICLE DETECTION SYSTEM FOR SIGNALIZED INTERSECTION CONTROL
ITEM 6013 PREPARATION OF EXISTING GROUND BOXES AND MANHOLES <432> <440><465><624>
ITEM 6438 DCS48247-ITEM DESCRIPTION NOT FOUND ON TACS TABLE: CONTACT CST

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	**0918-00-392**
Project	**C 918-00-392**
Highway	**VA**
County	**DALLAS**

SMALL BUSINESS ENTERPRISE REQUIREMENTS

The following goal for small business enterprises is established:

SBE
0.0%

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 Provision to Item 000
Special Labor Provisions for State Projects

1. GENERAL

This is a "Public Works" Project, as provided under Government Code, Chapter 2258, "Prevailing Wage Rates," and is subject to the provisions of the statute. No provisions in the Contract are intended to conflict with the provisions of the statute.

The Commission has ascertained and indicated in the Special Provisions the regular rate of per diem wages prevailing in each locality for each craft or type of worker. Apply the wage rates contained in the Specifications as minimum wage rates for the Contract.

2. MINIMUM WAGES, HOURS, AND CONDITIONS OF EMPLOYMENT

All workers necessary for the satisfactory completion of the work are within the purview of the Contract.

Whenever and wherever practical, give local citizens preference in the selection of labor.

Do not require any worker to lodge, board, or trade at a particular place, or with a particular person, as a condition of employment.

Do not charge or accept a fee of any from any person who obtains work on the project. Do not require any person who obtains work on the project to pay any fee to any other person or agency obtaining employment for the person on the project.

Do not charge for tools or equipment used in connection with the duties performed, except for loss or damage of property. Do not charge for necessary camp water.

Do not charge for any transportation furnished to any person employed on the project.

The provisions apply where work is performed by piece work and station work. The minimum wage paid will be exclusive of equipment rental on any shipment that the worker or subcontractor may furnish in connection with their work.

Take responsibility for carrying out the requirements of this Specification and ensure that each subcontractor working on the project complies with its provisions.

Any form of subterfuge, coercion, or deduction designated to evade, reduce, or discount the established minimum wage scales will be considered a violation of the Contract.

The Fair Labor Standards Act established one and one-half (1-1/2) pay for overtime in excess of 40 hr. worked in 1 week. Do not consider time consumed by the worker in going to and returning from the place of work as part of the hours of work. Do not require or permit any worker to work more than 40 hr. in 1 week, unless the worker receives compensation at a rate not less than 1-1/2 times the basic rate of pay for all hours worked in excess of 40 hr. in the workweek.

The general rates of per diem wages prevailing in this locality for each class and type of workers whose services are considered necessary to fulfill the Contract are indicated in the Special Provisions, and these rates govern as minimum wage rates on this Contract. A penalty of $60 per calendar day or portion of a calendar day for each worker who is paid less than the stipulated general rates of per diem wages for any work done under the Contract will be deducted. The Department, upon receipt of a complaint by a worker,

will determine within 30 days whether good cause exists to believe that the Contractor or a subcontractor has violated wage rate requirements and notify the parties involved of the findings. Make every effort to resolve the alleged violation within 14 days after notification. The next alternative is submittal to binding arbitration in accordance with the provisions of the Texas General Arbitration Act (Article 224 et seq., "Revised Statutes").

Notwithstanding any other provision of the Contract, covenant and agree that the Contractor and its subcontractors will pay each of their employees and contract labor engaged in any way in work under the Contract, a wage not less than what is generally known as the "federal minimum wage" in accordance with 29 USC § 206 as that statute may be amended from time to time.

Pay any worker employed whose position is not listed in the Contract, a wage not less than the per diem wage rate established in the Contract for a worker whose duties are most nearly comparable.

3. RECORD AND INSPECTIONS

Keep copies of weekly payrolls for review. Require subcontractors to keep copies of weekly payrolls for review. Show the name, occupation, number of hours worked each day, and per diem wage paid each worker together with a complete record of all deductions made from such wages. Keep records for a period of 3 yr. from the date of completion of the Contract.

Where the piece-work method is used, indicate on the payroll for each person involved:

- quantity of piece work performed,
- price paid per piece-work unit, and
- total hours employed.

The Engineer may require the Contractor to file an affidavit for each payroll certifying that payroll is a true and accurate report of the full wages due and paid to each person employed.

Post or make available to employees the prevailing wage rates from the Contract. Require subcontractors to post or make available to employees the prevailing wage rates from the Contract.

The wage rates listed herein are those predetermined by the Secretary of Labor and State Statue and listed in the United States Department of Labor's (USDOL) General Decisions dated 01-05-2024 and are the minimum wages to be paid accordingly for each specified classification. To determine the applicable wage rate zone, a list entitled "TEXAS COUNTIES IDENTIFIED BY WAGE RATE ZONES" is provided in the contract. Any wage rate that is not listed herein and not in the USDOL's general decision, must be requested by the contractor through the completion of an Additional Classification and Wage Rate Request and be submitted for approval. IMPORTANT NOTICE FOR STATE PROJECTS: only the controlling wage rate zone applies to the contract. Effective 01-05-2024.

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX02 *(TX20240002)	ZONE TX03 *(TX20240003)	ZONE TX04 *(TX20240004)	ZONE TX05 *(TX20240005)	ZONE TX06 *(TX20240006)	ZONE TX07 *(TX20240007)	ZONE TX08 *(TX20240008)	ZONE TX24 *(TX20240024)	ZONE TX25 *(TX20240025)	ZONE TX27 *(TX20240027)	ZONE TX28 *(TX20240028)	ZONE TX29 *(TX20240029)	ZONE TX30 *(TX20240030)	ZONE TX37 *(TX20240037)	ZONE TX38 *(TX20240038)	ZONE TX42 *(TX20240042)
1428	Agricultural Tractor Operator						$12.69					$12.35			$11.75		
1300	Asphalt Distributor Operator	$14.87	$13.48	$13.88	$15.72	$15.58	$15.55	$15.72	$13.28	$15.32	$15.62	$14.36	$14.25	$14.03	$13.75	$14.06	$14.40
1303	Asphalt Paving Machine Operator	$13.40	$12.25	$12.35	$13.87	$14.05	$14.36	$14.20	$13.26	$13.99	$14.68	$12.92	$13.44	$12.53	$14.00	$14.32	$12.99
1106	Asphalt Raker	$12.28	$10.61	$12.02	$14.21	$11.65	$12.12	$11.64	$11.44	$12.69	$12.05	$11.34	$11.67	$11.40	$12.59	$12.36	$11.78
1112	Batching Plant Operator, Asphalt																
1115	Batching Plant Operator, Concrete																
1214	Blaster																
1615	Boom Truck Operator						$18.36										
1444	Boring Machine Operator																
1305	Broom or Sweeper Operator	$11.21	$10.33	$10.08	$11.99		$11.04	$11.62		$11.74	$11.41	$10.30		$10.23	$10.60	$12.68	$11.05
1144	Communications Cable Installer																
1124	Concrete Finisher, Paving and Structures	$13.55	$12.46	$13.16	$12.85	$12.64	$12.56	$12.77	$12.44	$14.12	$13.04	$13.38	$12.64	$12.80	$12.79	$12.98	$13.32
1318	Concrete Pavement Finishing Machine Operator				$16.05		$15.48			$16.05		$19.31				$13.07	
1315	Concrete Paving, Curing, Float, Texturing Machine Operator											$16.34				$11.71	
1333	Concrete Saw Operator				$14.67					$14.48	$17.33					$13.99	
1399	Concrete/Gunite Pump Operator																
1344	Crane Operator, Hydraulic 80 tons or less				$18.22		$18.36			$18.12	$18.04	$20.21			$18.63	$13.86	
1345	Crane Operator, Hydraulic Over 80 Tons																
1342	Crane Operator, Lattice Boom 80 Tons or Less	$16.82	$14.39	$13.85	$17.27		$15.87			$17.27		$14.67			$16.42	$14.97	$13.87
1343	Crane Operator, Lattice Boom Over 80 Tons				$20.52		$19.38			$20.52		$17.49			$25.13	$15.80	
1306	Crawler Tractor Operator	$13.96	$16.63	$13.62	$14.26		$15.67			$14.07	$13.15	$13.38			$14.60	$13.68	$13.50
1351	Crusher or Screen Plant Operator																
1446	Directional Drilling Locator						$11.67										
1445	Directional Drilling Operator				$20.32		$17.24										
1139	Electrician	$20.96		$19.87	$19.80		$26.35		$20.27	$19.80		$20.92				$27.11	$19.87
1347	Excavator Operator, 50,000 pounds or less	$13.46	$12.56	$13.67	$17.19		$12.88	$14.38	$13.49	$17.19		$13.88			$14.09	$12.71	$14.42
1348	Excavator Operator, Over 50,000 pounds		$15.23	$13.52	$17.04		$17.71			$16.99	$18.80	$16.22				$14.53	$13.52
1150	Flagger	$9.30	$9.10	$8.50	$10.28	$8.81	$9.45	$8.70		$10.06	$9.71	$9.03	$8.81	$9.08	$9.90	$10.33	$8.10
1151	Form Builder/Setter, Structures	$13.52	$12.30	$13.38	$12.91	$12.71	$12.87	$12.38	$12.26	$13.84	$12.98	$13.07	$13.61	$12.82	$14.73	$12.23	$12.25
1160	Form Setter, Paving & Curb	$12.36	$12.16	$13.93	$11.83	$10.71	$12.94			$13.16	$12.54	$11.33	$10.69		$13.33	$12.34	$13.93
1360	Foundation Drill Operator, Crawler Mounted				$17.99					$17.99						$17.43	
1363	Foundation Drill Operator, Truck Mounted		$16.86	$22.05	$21.51		$16.93			$21.07	$20.20	$20.76		$17.54	$21.39	$15.89	$22.05
1369	Front End Loader Operator, 3 CY or Less	$12.28	$13.49	$13.40	$13.85		$13.04	$13.15	$13.29	$13.69	$12.64	$12.89			$13.51	$13.32	$12.17
1372	Front End Loader Operator, Over 3 CY	$12.77	$13.69	$12.33	$14.96		$13.21	$12.86	$13.57	$14.72	$13.75	$12.32			$13.19	$13.17	$13.02
1329	Joint Sealer																
1172	Laborer, Common	$10.30	$9.86	$10.08	$10.51	$10.71	$10.50	$10.24	$10.58	$10.72	$10.45	$10.30	$10.25	$10.03	$10.54	$11.02	$10.15
1175	Laborer, Utility	$11.80	$11.53	$12.70	$12.17	$11.81	$12.27	$12.11	$11.33	$12.32	$11.80	$11.53	$11.23	$11.50	$11.95	$11.73	$12.37
1346	Loader/Backhoe Operator	$14.18	$12.77	$12.97	$15.68		$14.12			$15.18	$13.58	$12.87		$13.21	$14.13	$14.29	$12.90
1187	Mechanic	$20.14	$15.47	$17.47	$17.74	$17.00	$17.10			$17.68	$18.94	$18.58	$17.00	$16.61	$18.46	$16.96	$17.47

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX02 *(TX20240002)	ZONE TX03 *(TX20240003)	ZONE TX04 *(TX20240004)	ZONE TX05 *(TX20240005)	ZONE TX06 *(TX20240006)	ZONE TX07 *(TX20240007)	ZONE TX08 *(TX20240008)	ZONE TX24 *(TX20240024)	ZONE TX25 *(TX20240025)	ZONE TX27 *(TX20240027)	ZONE TX28 *(TX20240028)	ZONE TX29 *(TX20240029)	ZONE TX30 *(TX20240030)	ZONE TX37 *(TX20240037)	ZONE TX38 *(TX20240038)	ZONE TX42 *(TX20240042)
1380	Milling Machine Operator	$15.54	$14.64	$12.22	$14.29		$14.18			$14.32	$14.35	$12.86			$14.75	$13.53	$12.80
1390	Motor Grader Operator, Fine Grade	$17.49	$16.52	$16.88	$17.12	$18.37	$18.51	$16.69	$16.13	$17.19	$18.35	$17.07	$17.74	$17.47	$17.08	$15.69	$20.01
1393	Motor Grader Operator, Rough	$16.15	$14.62	$15.83	$16.20	$17.07	$14.63	$18.50		$16.02	$16.44	$15.12	$16.85	$14.47	$17.39	$14.23	$15.53
1413	Off Road Hauler			$10.08	$12.26		$11.88			$12.25		$12.23			$13.00	$14.60	
1196	Painter, Structures					$21.29	$18.34						$21.29			$18.62	
1396	Pavement Marking Machine Operator	$16.42		$13.10	$13.55		$19.17	$12.01		$13.63	$14.60	$13.17		$16.65	$10.54	$11.18	$13.10
1443	Percussion or Rotary Drill Operator																
1202	Piledriver															$14.95	
1205	Pipelayer		$11.87	$14.64	$13.17	$11.17	$12.79		$11.37	$13.24	$12.66	$13.24	$11.17	$11.67		$12.12	$14.64
1384	Reclaimer/Pulverizer Operator	$12.85			$11.90		$12.88			$11.01		$10.46					
1500	Reinforcing Steel Worker	$13.50	$14.07	$17.53	$16.17		$14.00			$16.18	$12.74	$15.83		$17.10		$15.15	$17.72
1402	Roller Operator, Asphalt	$10.95		$11.96	$13.29		$12.78	$11.61		$13.08	$12.36	$11.68			$11.71	$11.95	$11.50
1405	Roller Operator, Other	$10.36		$10.44	$11.82		$10.50	$11.64		$11.51	$10.59	$10.30		$12.04	$12.85	$11.57	$10.66
1411	Scraper Operator	$10.61	$11.07	$10.85	$12.88		$12.27		$11.12	$12.96	$11.88	$12.43		$11.22	$13.95	$13.47	$10.89
1417	Self-Propelled Hammer Operator																
1194	Servicer	$13.98	$12.34	$14.11	$14.74		$14.51	$15.56	$13.44	$14.58	$14.31	$13.83		$12.43	$13.72	$13.97	$14.11
1513	Sign Erector																
1708	Slurry Seal or Micro-Surfacing Machine Operator																
1341	Small Slipform Machine Operator									$15.96							
1515	Spreader Box Operator	$12.60		$13.12	$14.71		$14.04			$14.73	$13.84	$13.68		$13.45	$11.83	$13.58	$14.05
1705	Structural Steel Welder															$12.85	
1509	Structural Steel Worker						$19.29									$14.39	
1339	Subgrade Trimmer																
1143	Telecommunication Technician																
1145	Traffic Signal/Light Pole Worker						$16.00										
1440	Trenching Machine Operator, Heavy						$18.48										
1437	Trenching Machine Operator, Light																
1609	Truck Driver Lowboy-Float	$14.46	$13.63	$13.41	$15.00	$15.93	$15.66			$16.24	$16.39	$14.30	$16.62	$15.63	$14.28	$16.03	$13.41
1612	Truck Driver Transit-Mix				$14.14					$14.14							
1600	Truck Driver, Single Axle	$12.74	$10.82	$10.75	$13.04	$11.61	$11.79	$13.53	$13.16	$12.31	$13.40	$10.30	$11.61		$11.97	$11.46	$10.75
1606	Truck Driver, Single or Tandem Axle Dump Truck	$11.33	$14.53	$11.95	$12.95		$11.68		$14.06	$12.62	$11.45	$12.28		$13.08	$11.68	$11.48	$11.10
1607	Truck Driver, Tandem Axle Tractor withSemi Trailer	$12.49	$12.12	$12.50	$13.42		$12.81	$13.16		$12.86	$16.22	$12.50			$13.80	$12.27	$12.50
1441	Tunneling Machine Operator, Heavy																
1442	Tunneling Machine Operator, Light																
1706	Welder		$14.02		$14.86		$15.97		$13.74	$14.84					$13.78		
1520	Work Zone Barricade Servicer	$10.30	$12.88	$11.46	$11.70	$11.57	$11.85	$10.77		$11.68	$12.20	$11.22	$11.51	$12.96	$10.54	$11.67	$11.76

Notes:

*Represents the USDOL wage decision.

Any worker employed on this project shall be paid at the rate of one and one half (1-1/2) times the regular rate for every hour worked in excess of forty (40) hours per week.

For reference, the titles and descriptions for the classifications listed here are detailed further in the AGC of Texas' *Standard Job Classifications and Descriptions for Highway, Heavy, Utilities, and Industrial Construction in Texas* posted on the AGC's Web site for any contractor.

TEXAS COUNTIES IDENTIFIED BY
WAGE RATE ZONES: 2, 3, 4, 5, 6, 7, 8, 24, 25, 27, 28, 29, 30, 37, 38, 42

County Name	Zone	County Name	Zone	County Name	Zone	County Name	Zone
Anderson	28	Donley	37	Karnes	27	Reagan	37
Andrews	37	Duval	30	Kaufman	25	Real	37
Angelina	28	Eastland	37	Kendall	7	Red River	28
Aransas	29	Ector	2	Kenedy	30	Reeves	8
Archer	25	Edwards	8	Kent	37	Refugio	27
Armstrong	2	El Paso	24	Kerr	27	Roberts	37
Atascosa	7	Ellis	25	Kimble	37	Robertson	7
Austin	38	Erath	28	King	37	Rockwall	25
Bailey	37	Falls	28	Kinney	8	Runnels	37
Bandera	7	Fannin	28	Kleberg	27	Rusk	4
Bastrop	7	Fayette	27	Knox	37	Sabine	28
Baylor	37	Fisher	37	Lamar	28	San Augustine	28
Bee	27	Floyd	37	Lamb	37	San Jacinto	38
Bell	7	Foard	37	Lampasas	7	San Patricio	29
Bexar	7	Fort Bend	38	LaSalle	30	San Saba	37
Blanco	27	Franklin	28	Lavaca	27	Schleicher	37
Borden	37	Freestone	28	Lee	27	Scurry	37
Bosque	28	Frio	27	Leon	28	Shackelford	37
Bowie	4	Gaines	37	Liberty	38	Shelby	28
Brazoria	38	Galveston	38	Limestone	28	Sherman	37
Brazos	7	Garza	37	Lipscomb	37	Smith	4
Brewster	8	Gillespie	27	Live Oak	27	Somervell	28
Briscoe	37	Glasscock	37	Llano	27	Starr	30
Brooks	30	Goliad	29	Loving	37	Stephens	37
Brown	37	Gonzales	27	Lubbock	2	Sterling	37
Burleson	7	Gray	37	Lynn	37	Stonewall	37
Burnet	27	Grayson	25	Madison	28	Sutton	8
Caldwell	7	Gregg	4	Marion	28	Swisher	37
Calhoun	29	Grimes	28	Martin	37	Tarrant	25
Callahan	25	Guadalupe	7	Mason	27	Taylor	2
Cameron	3	Hale	37	Matagorda	27	Terrell	8
Camp	28	Hall	37	Maverick	30	Terry	37
Carson	2	Hamilton	28	McCulloch	37	Throckmorton	37
Cass	28	Hansford	37	McLennan	7	Titus	28
Castro	37	Hardeman	37	McMullen	30	Tom Green	2
Chambers	38	Hardin	38	Medina	7	Travis	7
Cherokee	28	Harris	38	Menard	37	Trinity	28
Childress	37	Harrison	42	Midland	2	Tyler	28
Clay	25	Hartley	37	Milam	28	Upshur	4
Cochran	37	Haskell	37	Mills	37	Upton	37
Coke	37	Hays	7	Mitchell	37	Uvalde	30
Coleman	37	Hemphill	37	Montague	37	Val Verde	8
Collin	25	Henderson	28	Montgomery	38	Van Zandt	28
Collingsworth	37	Hidalgo	3	Moore	37	Victoria	6
Colorado	27	Hill	28	Morris	28	Walker	28
Comal	7	Hockley	37	Motley	37	Waller	38
Comanche	37	Hood	28	Nacogdoches	28	Ward	37
Concho	37	Hopkins	28	Navarro	28	Washington	28
Cooke	37	Houston	28	Newton	28	Webb	3
Coryell	7	Howard	37	Nolan	37	Wharton	27
Cottle	37	Hudspeth	8	Nueces	29	Wheeler	37
Crane	37	Hunt	25	Ochiltree	37	Wichita	5
Crockett	8	Hutchinson	37	Oldham	37	Wilbarger	37
Crosby	2	Irion	2	Orange	38	Willacy	30
Culberson	8	Jack	28	Palo Pinto	28	Williamson	7
Dallam	37	Jackson	27	Panola	28	Wilson	7
Dallas	25	Jasper	28	Parker	25	Winkler	37
Dawson	37	Jeff Davis	8	Parmer	37	Wise	25
Deaf Smith	37	Jefferson	38	Pecos	8	Wood	28
Delta	25	Jim Hogg	30	Polk	28	Yoakum	37
Denton	25	Jim Wells	27	Potter	2	Young	37
DeWitt	27	Johnson	25	Presidio	8	Zapata	30
Dickens	37	Jones	25	Rains	28	Zavala	30
Dimmit	30			Randall	2		

01/05/2024

Special Provision to Item 000
Nondiscrimination

1. DESCRIPTION

All recipients of federal financial assistance are required to comply with various nondiscrimination laws, including Title VI of the Civil Rights Act of 1964, as amended (Title VI). Title VI forbids discrimination against anyone in the United States on the grounds of race, color, or national origin by any agency receiving federal funds.

The Texas Department of Transportation, as a recipient of federal financial assistance, and under Title VI and related statutes, ensures that no person will on the grounds of race, religion (where the primary objective of the financial assistance is to provide employment in accordance with 42 USC 2000d-3), color, national origin, sex, age, or disability be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any Department programs or activities.

2. DEFINITION OF TERMS

Where the term "Contractor" appears in the following six nondiscrimination clauses, the term "Contractor" is understood to include all parties to Contracts or agreements with the Department.

3. NONDISCRIMINATION PROVISIONS

During the performance of this Contract, the Contractor agrees as follows.

3.1. **Compliance with Regulations**. The Contractor must comply with the Regulations pertinent to nondiscrimination in federally assisted programs of the United States Department of Transportation 49 CFR 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this Contract.

3.2. **Nondiscrimination**. The Contractor, regarding the work performed during the Contract, must not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor must not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the Contract covers a program set forth in Appendix B of the Regulations.

3.3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment**. In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, the Contractor must notify each potential subcontractor or supplier of the Contractor's obligations under this Contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

3.4. **Information and Reports**. The Contractor must provide all information and reports required by the Regulations or directives issued pursuant thereto, and must permit access to its books, records, accounts, other sources of information, and facilities as may be determined by the Recipient or the Department to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor must so certify to the Recipient, or the Department as appropriate, and must set forth what efforts it has made to obtain the information.

3.5. **Sanctions for Noncompliance**. In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, the Recipient must impose such Contract sanctions as it or the Department may

determine to be appropriate, including, but not limited to actions defined in Article 7.1., “Ethics,” or Article 5.1., “Authority of Engineer.”

3.6. **Incorporation of Provisions**. The Contractor must include the provisions of Sections 3.1–3.6 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The Contractor must take such action with respect to any subcontract or procurement as the Recipient or the Department may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that, in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request the Recipient to enter into such litigation to protect the interests of the Recipient, and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

Special Provision 000
Important Notice to Contractors

1. GENERAL

In accordance with Texas Transportation Code §223.012, the Engineer will evaluate Contractor performance based on quality, safety, and timeliness of the project.

2. DEFINISIONS

2.1. **Project Recovery Plan (PRP)**. A formal, enforceable plan developed by the Contractor, in consultation with the District, that documents the cause of noted quality, safety, and timeliness issues and specifies how the Contractor proposes to correct project-specific performance deficiencies.

In accordance with 43 TAC §9.23, the District will request a PRP if the Contractor's performance on a project is below the Department's acceptable standards and will monitor the Contractor's compliance with the established plan.

2.2. **Corrective Action Plan (CAP)**. A formal, enforceable plan developed by the Contractor, and proposed for adoption by the Construction Division or Maintenance Division, that documents the cause of noted quality, safety, and timeliness issues and specifies how the Contractor proposes to correct statewide performance deficiencies.

3. CONTRACTOR EVALUATIONS

In accordance with 43 TAC §9.23, the Engineer will schedule evaluations at the following intervals, at minimum:

- interim evaluations at or within 30 days after the anniversary of the Notice to Proceed, for Contracts extending beyond 1 yr. and
- final evaluation, upon project closeout.

In case of a takeover agreement, neither the Surety nor its performing Contractor will be evaluated.

In addition to regularly scheduled evaluations, the Engineer may schedule an interim evaluation at any time to formally communicate issues with quality, safety, or timeliness. Upon request, work with the Engineer to develop a PRP to document expectations for correcting deficiencies.

Comply with the PRP as directed. Failure to comply with the PRP may result in additional remedial actions available to the Engineer under Item 5, "Control of the Work." Failure to meet a PRP to the Engineer's satisfaction may result in immediate referral to the Performance Review Committee for consideration of further action against the Contractor.

The Engineer will consider and document any events outside the Contractor's control that contributed to the failure to meet performance standards or comply with a PRP, including consideration of sufficient time.

Follow the escalation ladder if there is a disagreement regarding an evaluation or disposition of a PRP. The Contractor may submit additional documentation pertaining to the dispute. The District Engineer's decision on a Contractor's evaluation score and recommendation of action required in a PRP or follow-up for noncompliance is final.

4. DIVISION OVERSIGHT

Upon request of the Construction Division or Maintenance Division, develop and submit for Division approval a proposed CAP to document expectations for correcting deficiencies in the performance of projects statewide.

Comply with the CAP as directed. The CAP may be modified at any time up to completion or resolution after written approval of the premise of change from the Division. Failure to meet an adopted or revised adopted CAP to the Division's satisfaction within 120 days will result in immediate referral to the Performance Review Committee for consideration of further action against the Contractor.

The Division will consider and document any events outside the Contractor's control that contributed to the failure to meet performance standards or comply with a CAP, including consideration of sufficient time and associated costs as appropriate.

5. PERFORMANCE REVIEW COMMITTEE

The Performance Review Committee, in accordance with 43 TAC §9.24, will review at minimum all final evaluations, history of compliance with PRPs, any adopted CAPs including agreed modifications, any information about events outside a Contractor's control contributing to the Contractor's performance, and any documentation submitted by the Contractor and may recommend one or more of the following actions:

- take no action,
- reduce the Contractor's bidding capacity,
- prohibit the Contractor from bidding on one or more projects,
- immediately suspend the Contractor from bidding for a specified period of time, by reducing the Contractor's bidding capacity to zero, or
- prohibit the Contractor from being awarded a Contract on which they are the apparent low bidder.

The Deputy Executive Director will determine any further action against the Contractor.

6. APPEALS PROCESS

In accordance with 43 TAC §9.25, the Contractor may appeal remedial actions determined by the Deputy Executive Director.

Special Provision 000
Certificate of Interested Parties (Form 1295)

Submit Form 1295, “Certificate of Interested Parties,” in the following instances:

- at Contract execution for Contracts awarded by the Commission,
- at Contract execution for Contracts awarded by the District Engineer or Chief Engineer with an award amount of $1 million or more,
- at any time an existing Contract awarded by the District Engineer or Chief Engineer increases in value to $1 million or more because of changes in the Contract,
- at any time there is an increase of $1 million or more to an existing Contract (e.g., change orders, extensions, and renewals), and
- at any time there is a change to the information in Form 1295, when the form was filed for an existing Contract.

Form 1295 and instructions for completing and filing the form are available on the Texas Ethics Commission website.

Special Provision 000
Important Notice to Contractors

Table 1
Daily Contract Administration Liquidated Damages

For Dollar Amount of Original Contract		Dollar Amount of Daily Contract Administration Liquidated Damages per Working Day
From More Than	To and Including	
0	1,000,000	618
1,000,000	3,000,000	832
3,000,000	5,000,000	940
5,000,000	15,000,000	1,317
15,000,000	25,000,000	1,718
25,000,000	50,000,000	2,411
50,000,000	Over 50,000,000	4,265

In addition to the amount shown in Table 1, the liquidated damages will be increased by the amount shown in Item 8 of the General Notes for Road User Cost (RUC), when applicable.

Special Provision to Item 000
Small Business Enterprise in State-Funded Projects

1. DESCRIPTION

The purpose of this Special Provision is to implement the Department's policy of ensuring that SBEs have an opportunity to participate in the performance of Contracts. If the SBE goal is greater than zero, Section 2.1., "Article A—SBE Goal is Greater than Zero," will apply to this Contract; otherwise, Section 2.2., "Article B—No SBE Goal," will apply. The percentage goal for SBE participation in the work to be performed under this Contract will be in accordance with the proposal.

2. DEFINITIONS

A Small Business Enterprise (SBE) is a firm certified as such by the Department. Firms certified as Historically Underutilized Businesses (HUBs) by the Texas Comptroller of Public Accounts and as Disadvantaged Business Enterprises (DBEs) by the Texas Uniform Certification Program automatically qualify as SBEs.

2.1. **Article A—SBE Goal is Greater than Zero**.

2.1.1. **Policy**. The Department is committed to providing contracting opportunities for small businesses. Therefore, it is the Department's policy to develop and maintain a program to facilitate contracting opportunities for small businesses. Consequently, the requirements of the Department's SBE Program apply to this Contract as follows.

The Contractor will make a good faith effort to meet the SBE goal for this Contract.

The Contractor and any subcontractors will not discriminate on the basis of race, color, national origin, age, disability, or sex in the award and performance of this Contract. These nondiscrimination requirements must be incorporated into any subcontract and purchase order.

After a conditional award is made to the low Bidder, the Department will determine the adequacy of a Contractor's efforts to meet the Contract goal, in accordance with Section 2.1.2., "Contractor's Responsibilities." If the requirements in accordance with Section 2.1.2., "Contractor's Responsibilities," are met, the Contract will be forwarded to the Contractor for execution.

The Contractor's performance in meeting the SBE goal during the construction period of the Contract will be monitored by the Department.

2.1.2. **Contractor's Responsibilities**. These requirements must be satisfied by the Contractor. An SBE Contractor may satisfy the SBE requirements by performing at least 25% of the Contract work with their own organization in accordance with Item 8, "Prosecution and Progress."

The Contractor must complete an SBE Commitment Agreement Form for each SBE-certified firm the Contractor intends to use to satisfy the SBE goal. The SBE Commitment Agreement Form must be submitted to the Department's Civil Rights Division (CIV) in Austin, Texas, no later than 5 P.M. on the 10th business day, excluding national holidays, after the conditional award of the Contract. When requested, additional time not to exceed 7 business days, excluding national holidays, may be granted based on documentation submitted by the Contractor.

A Contractor that cannot meet the Contract goal, in whole or in part, must document the good faith efforts taken to meet the SBE goal. The Department will consider as good faith efforts all documented explanations

that are submitted and that describe a Contractor's failure to meet an SBE goal or obtain SBE participation, including:

- advertising in general circulation, trade association, and minority- or women-focused media regarding subcontracting opportunities,
- dividing the Contract work into reasonable portions in conformance with standard industry practices,
- documenting reasons for rejection or meeting with the rejected SBE to discuss the rejection,
- providing qualified SBEs with adequate information pertinent to bonding, insurance, plans, Specifications, scope of work, and the requirements of the Contract,
- negotiating in good faith with qualified SBEs, not rejecting qualified SBEs that are also the lowest responsive Bidder; and
- using the services of available minorities and women; community organizations; Contractor groups; local, state, and federal business assistance offices; and other organizations that provide support services to SBEs.

The good faith effort documentation is due at the time and place in accordance with this Section. CIV will evaluate the Contractor's documentation. If it is determined that the Contractor has failed to meet the good faith effort requirements, the Contractor will be given an opportunity for reconsideration by the Department.

Should the Bidder to which the Contract is conditionally awarded refuse, neglect, or fail to meet the SBE goal or demonstrate to the Department's satisfaction sufficient efforts to obtain SBE participation, the proposal guaranty filed with the bid will become the property of the State, not as a penalty, but as liquidated damages.

The Contractor must not terminate an SBE subcontractor submitted on a commitment agreement for a Contract with an assigned goal without the prior written consent of the Department.

The Contractor must designate an SBE contact person who will administer the Contractor's SBE program and who will be responsible for submitting reports, maintaining records, and documenting good faith efforts to use SBEs.

The Contractor must inform the Department of the representative's name, title, and telephone number within 10 days of beginning work.

2.1.3. **Eligibility of SBEs**. The Department certifies the eligibility of SBEs.

Firms certified as SBEs are listed in the Department's online directory located at https://txdot.txdotcms.com/.

Only firms certified at the time of letting or at the time the commitments are submitted are eligible to be used in the information furnished by the Contractor in accordance with Section 2.1.2., "Contractor's Responsibilities."

Certified HUBs and DBEs are eligible as SBEs.

The Department's SBE Program is governed by 43 TAC, Chapter 9, Subchapter K, "Small Business Enterprise (SBE) Program."

2.1.4. **Determination of SBE Participation**. SBE participation will be counted toward meeting the SBE goal in this Contract in accordance with the following.

A Contractor will receive credit for all payments actually made to an SBE for work performed and costs incurred in accordance with the Contract, including all subcontracted work.

An SBE Contractor or subcontractor may not subcontract more than 75% of a Contract. The SBE must perform no less than 25% of the value of the Contract work with their own organization in accordance with Item 8.

An SBE may lease equipment consistent with standard industry practice. An SBE may lease equipment from the prime Contractor if a rental agreement, separate from the subcontract specifying the terms of the lease arrangement, is approved by the Department before the SBE starting the work in accordance with the following.

- If the equipment is of a specialized nature, the lease may include the operator. If the practice is generally acceptable with the industry, the operator may remain on the lessor's payroll. The operator of the equipment must be subject to the full control of the SBE, for a short term, and involve a specialized piece of heavy equipment readily available at the jobsite.
- For equipment that is not specialized, the SBE must provide the operator and be responsible for all payroll and labor compliance requirements.

2.1.5. **Records and Reports**. The Contractor must submit monthly reports of SBE payments (including payments to HUBs and DBEs) to the Area Engineer's Office after work begins. These reports will be due within 15 days after the end of a calendar month.

These reports will be required until all SBE subcontracting or supply activity is completed. The SBE Progress Report must be used for monthly reporting. Upon completion of the Contract and before receiving the final payment, the Contractor must submit the SBE Final Report to the Area Engineer's Office and a copy to the District Construction Office. These forms may be obtained from CIV and reproduced as necessary. The Department may verify the amounts being reported as paid to SBEs by randomly requesting copies of invoices and cancelled checks paid to SBEs. When the SBE goal requirement is not met, documentation supporting good faith efforts, in accordance with Section 2.1.2., "Contractor's Responsibilities," must be submitted with the SBE Final Report.

SBE subcontractors and suppliers should be identified on the monthly report by SBE certification number, name, and the amount of actual payment made to each during the monthly period. These reports are required regardless of whether SBE activity has occurred in the monthly reporting period.

All such records must be retained for 3 yr. following completion of the Contract work and be available at reasonable times and places for inspection by authorized representatives of the Department.

2.1.6. **Compliance of Contractor**. To ensure compliance with SBE requirements of this Contract, the Department will monitor the Contractor's efforts to involve SBEs during the performance of this Contract. This will be accomplished by a review of monthly reports submitted by the Contractor indicating their progress in achieving the SBE Contract goal and by compliance reviews conducted by the Department.

A Contractor's failure to comply with the requirements of this Special Provision will constitute a material breach of this Contract. In such a case, the Department reserves the right to employ remedies as the Department deems appropriate in the terms of the Contract.

2.2. **Article B—No SBE Goal.**

2.2.1. **Policy**. It is the Department's policy that SBEs will have an opportunity to participate in the performance of Contracts.

2.2.2. **Contractor's Responsibilities**. If there is no SBE goal, the Contractor must offer SBEs an opportunity to participate in the performance of Contracts and subcontracts. If an SBE is used, the requirements in accordance with Section 2.1.4., "Determination of SBE Participation," will apply.

2.2.3. **Prohibit Discrimination**. The Contractor and any subcontractor will not discriminate on the basis of race, color, national origin, religion, age, disability, or sex in the award and performance of Contracts. These nondiscrimination requirements must be incorporated into any subcontract and purchase order.

2.2.4. **Records and Reports**. The Contractor must submit annual reports pertinent to SBEs (including HUBs and DBEs) to the Area Engineer's Office by August 31 or at project completion, whichever comes first.

These reports will be required until all SBE subcontracting or supply activity is completed. The SBE Progress Report must be used for reporting. Upon completion of the Contract and before receiving the final payment, the Contractor must submit the SBE Final Report to the Area Engineer's Office and a copy to the District Construction Office. These forms may be obtained from CIV and reproduced as necessary. The Department may verify the amounts being reported as paid to SBEs by randomly requesting copies of invoices and cancelled checks paid to SBEs.

SBE subcontractors and suppliers should be identified on the report by SBE certification cumber, name, and the amount of actual payment made.

All such records must be retained for 3 yr. following completion of the Contract work and be available at reasonable times and places for inspection by authorized representatives of the Department.

Special Provision to Item 8
Prosecution and Progress

Item 8, "Prosecution and Progress," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 8.1., "Prosecution of Work," is voided and replaced by the following.

Begin work within 90 calendar days after the authorization date to begin work. Prosecute the work continuously to completion within the working days specified. Unless otherwise shown on the plans, work may be prosecuted in concurrent phases if no changes are required to the traffic control plan or if a revised traffic control plan is approved. Notify the Engineer at least 24 hr. before beginning work or before beginning any new operation. Do not start new operations to the detriment of work already begun. Minimize interference to traffic.

For Contracts with callout work and work orders, begin work in the right of way within the specified time and continuously prosecute the work until completion.

Special Specification 6006
Video Imaging Vehicle Detection System

1. DESCRIPTION

Furnish, install, relocate, or remove video imaging vehicle detection system (VIVDS) at locations shown on the plans, or as directed. Use VIVDS listed on the Department's prequalified products list.

2. MATERIALS

2.1. **General**. Furnish, assemble, and install only new materials except as allowed for relocation of VIVDS equipment. Ensure all VIVDS within the project are from the same manufacturer.

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

VIVDS equipment must include the following:

- camera and mounting hardware (fixed or variable focal length; infrared; or 360° "fish-eye"),
- VIVDS processor,
- cabinet control unit and associated devices required for system integration, and
- data, power, and communication cable, connectors, and assemblies.

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 five lanes of traffic simultaneously.

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.

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

2.2. **Configuration and Management**. Ensure that the VIVDS allows local and remote configuration and monitoring. The VIVDS must allow the user to fully configure the system and place detection zones using a mouse, monitor, and keyboard (or keypad) connected to the VIVDS. Provide each VIVDS with all associated equipment required to configure and operate the system in a field environment including a video monitor, mouse, keyboard (or keypad), software, and interface cables as applicable. The VIVDS must also support local configuration and monitoring using a laptop computer but must not require a computer for local configuration, monitoring, and operation.

Ensure that the system can display detection zones and detection activations overlaid on live video from VIVDS cameras.

Ensure that the VIVDS allows a user to edit previously defined configuration parameters, including size, placement, and sensitivity of detection zones.

Ensure that the VIVDS retains its programming in nonvolatile memory. Ensure that the detection system configuration settings can be saved to a computer and restored from a saved file locally and remotely. The system must allow stored configurations to be modified for fine-tuning and optimization. The VIVDS must continue to detect vehicles and operate normally while configuration and detection zone modifications are made.

Ensure the VIVDS does not require adjustment or recalibration to maintain performance once initial calibration and configuration is complete.

2.3. **Detection Zones**. The VIVDS must allow a user to configure detection zones using a graphical user interface (GUI) superimposed on a video image of the roadway. Ensure detection zones can be placed anywhere within a camera field of view. Ensure VIVDS detection zones can detect vehicle presence and collect traffic data, such as traffic counts.

Detection zones must appear as lines or polygons in the field of view. The system must allow a minimum of eight detection zones per field of view. VIVDS detection zones must be able to provide detection equivalent to a 6 ft. by 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 VIVDS 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**. VIVDS processor must compensate for minor camera movement. Movement up to 2% of field of view at 400 ft. must not produce a false detection.

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

VIVDS must simultaneously detect vehicles in all lanes. VIVDS must be able to accurately detect approaching and departing vehicles in multiple lanes. VIVDS is configurable for which direction of travel to detect. Ensure 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.

Ensure a constant call is placed on outputs associated with zones or cameras that are in an error state or failed. Ensure a constant call is placed on assigned outputs whenever the system is unable to provide accurate detection.

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

2.6. **Camera**. 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 NTSC composite video with a minimum resolution of at least 480 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 to 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.

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 to 13.5 µm.

Ensure analog video is compliant with National Television System Committee (NTSC) standard and has a minimum NTSC array format of 320 x 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 field of view. 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 does not interfere with the camera operation or video signal.

2.7. **Video Processor**. Ensure the VIVDS includes a machine vision processor that provides video analysis, presence detection, and interfaces for inputs and outputs. VIVDS must provide data collection features, including storage and reporting of collected vehicle detection data, when shown on the plans.

VIVDS must be able to interface with the traffic controller unit (CU) via the detector rack, SDLC, or another detector interface described in NEMA TS2-2016, unless otherwise shown on the plans. Solid state detection outputs must meet the requirements of NEMA TS2-2016, 6.5.2.26.

Each VIVDS detector rack card must have a minimum of four detector outputs. The system must be able to provide a total of 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 BIU using an RS-485 SDLC connector. TS2 Type 1 VIVDS 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 processors installed in the traffic controller cabinet must utilize digital video or accommodate asynchronous, synchronous, and line-locked analog video as part of a complete system engineered by the VIVDS manufacturer.

2.8. **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-amp breaker or blade type fuses and a power terminal strip with a minimum of eight 8/32 binder head screws for camera power connections. The panel must also have, as a minimum, four coax protectors (EDCO CX06 or equivalent). Additional lightning and transient protection will be allowed. All components that reside on the panel must be Department approved. For cameras utilizing POE the interface panel must consist of surge protection meeting GR 1089 standards.

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

2.9. **Cabling**. Supply the VIVDS 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 VIVDS manufacturer.

Ensure the power and data cable connectors are IP 67 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.

Fiber optic cable, if used, must meet the Department requirements as shown in the plans.

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

RS-485 and RS-232 communication cable must meet the requirements of Special Specification 6005, “Networking Intelligent Transportation System (ITS) Communications Cable.”

2.10. **Communication**. Ensure that the VIVDS includes a minimum of one serial or Ethernet communications interface.

Ensure serial interfaces and connectors conform to Telecommunications Industry Association (TIA)-232 standards. Ensure that the serial ports support data rates up to 115200 bps; error detection utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2).

Ensure that wired Ethernet interfaces provide a 10/100 Base TX connection. Verify that all unshielded twisted pair or shielded twisted pair network cables and connectors are in accordance with TIA-568.

Ensure 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 via one or more communications interface. Ensure that all communication addresses are user programmable.

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

Ensure VIVDS 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 7 Professional and newer.

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

VIVDS computer software must be able to communicate with VIVDS 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 VIVDS devices and allow the user to load new firmware into non-volatile memory of VIVDS 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 VIVDS 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.

2.12. **Mechanical**. VIVDS detector card rack units must be in accordance 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 VIVDS 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.

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

Ensure the VIVDS operates on nominal 120 V_{AC}. A power converter must be provided for devices that do not operate on nominal 120 V_{AC}. Camera sensors must operate between 12 V_{DC} and 28 V_{DC}.

2.14. **Environmental**. All VIVDS devices must operate properly during and after being subjected to the environmental testing procedures described in NEMA TS2, Section 2. VIVDS cameras 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.

2.15. **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.

2.16. **Documentation**. Provide hardcopy operation and maintenance 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, and
- 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 VIVDS electronic equipment meets FCC Class B requirements for electromagnetic interference and emissions.

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

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

2.17. **Warranty**. Warrant the equipment against defects or failure in design, materials, and workmanship for a minimum of 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 VIVDS 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 via telephone within 4 hr. of the time a call is made by a user, and this support must be available from factory certified personnel.

2.18. **Training**. Conduct a training class for a minimum of 8 hr., unless otherwise directed, for up to 10 representatives designated by the Department on installation, configuration, operation, testing, maintenance, troubleshooting, and repair. 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, their function and usage; and
- system "troubleshooting," operation, and maintenance.

3. CONSTRUCTION

3.1. **System Installation**. Install VIVDS 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, and finished appearance.

VIVDS installer must be certified by VIVDS manufacturer in proper installation setup and procedures. VIVDS integrator must be certified by the manufacturer for training end users in the maintenance, configuration, and operation of VIVDS.

Ensure VIVDS detector rack cards are properly installed and seated in the controller cabinet detector rack and use the card edge connector to obtain power and provide outputs. Rewiring the backplane or any other cabinet panel for the system is not permitted except for power and grounding for camera interface panels, wiring from the video camera sensor to the loop detector panel for the video signal inputs, as applicable, and wiring to obtain power for the VIVDS cameras.

Mount and aim cameras in a manner that eliminates as much environmentally generated glare as possible.

All wiring must be cut to proper length before assembly. Provide cable service loops. All cable slack must be neatly laced and placed in the bottom of the cabinet. Ensure cables are secured with clamps. Ensure cables between the controller cabinet and VIVDS cameras are continuous with no splices.

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

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

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 304 stainless steel and meet the requirements of ASTM F593 and ASTM F594 for corrosion resistance. Ensure that all bolts and nuts 5/8 in. and over in diameter are galvanized and meet the requirements of ASTM A307. Separate dissimilar metals with an inert dielectric material.

3.4. **Wiring**. All wiring and electrical work supplying the equipment must meet the requirements of the most current version of the National Electrical Code (NEC). Supply and install all wiring necessary to interconnect VIVDS cameras to the controller cabinet and incidentals 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.

Cables must be cut to proper length before assembly. Provide cable slack for ease of removal and replacement. All cable slack must be neatly laced with lacing or straps in the bottom of the cabinet. Ensure cables are secured with clamps and include service loops.

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

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

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

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

Before removal of existing VIVDS 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 such time that it can be relocated. Remove existing VIVDS field equipment as shown on the plans only when authorized.

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) at no cost to the Department.

Make all arrangements for connection to power and communications including any permits required for the work to be done under the Contract. Provide conductors for the power connection at least the minimum size indicated on the plans and insulated for 600 V. Meet the requirements of the NEC most current version.

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

Disconnect and isolate any existing electrical 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) at no cost to the Department.

All materials not designated for reuse or retention by the Department will become the property of the Contractor and be removed from the project site at the Contractor's expense. Deliver items to be retained by the Department to a location shown on the plans or General Notes. The Contractor is fully responsible for any removed equipment until released.

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 the installation of VIVDS.

3.9.2. **Completed Projects**. Three completed projects where personnel installed, tested, and integrated VIVDS field equipment. The completed installations must have been in continuous satisfactory operation for a minimum of 1 yr.

3.9.3. **Equipment Experience**. One project (may be 1 of the 3 projects in the preceding paragraph) 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 will not be required to furnish equipment on this project from the same supplier who 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 given above.

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 must approve test procedures before submission of equipment for tests. Conduct all tests in conformance with the approved test procedures.

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

4.2. **Design Approval Test**. Ensure that the VIVDS has successfully completed 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 conformance with the requirements of 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 the requirements of this Specification.

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

4.3.3. **Operational Test**. Operate each unit for at least 15 min. to permit equipment temperature stabilization and observation of a sufficient number of 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 VIVDS meets functional performance requirements of Section 2.55. using the following methods:

Verify presence detection accuracy at installed field sites by comparing sample data collected from the detection system with ground truth data collected by human observation. Collect samples and ground truth data for each detection zone for a minimum of 5 min. during a peak period and 5 min. during an off-peak period. Ensure the sample period for each zone includes a minimum of three vehicles. Perform tests in the presence of the Engineer.

Recorded video of all cameras showing vehicle detections during a 24-hr. period at each intersection must be provided within 30 days upon request. This video must allow verification of proper camera placement, field of view, 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, to 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 occurs 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 to resubmit, if necessary, rejected test procedures for final approval within 10 days. Review time is calendar days. Conduct all tests in conformance with the approved test procedures.

Conduct basic functionality testing before removal of VIVDS field equipment. Test all functional operations of the equipment in the presence of representatives of the Contractor and the Department. Ensure that both representatives sign the test report indicating that the equipment has passed or failed each function. Once removed, the equipment becomes the responsibility of the Contractor until accepted by the Department. Compare test data before removal and 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 VIVDS field equipment is for relieving the Contractor of maintenance of the system. The Contractor will be relieved of the responsibility for maintenance of the system 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 VIVDS 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 Engineer's 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 a 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 turn over 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 his representative to observe each test.

The Department will conduct approved VIVDS field equipment system tests on the field equipment with the central equipment. The tests will, as a 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 VIVDS 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 VIVDS 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, other referenced Special Specifications, or as directed.

When the VIVDS is used on a temporary basis, the VIVDS will be measured as each system furnished, installed, 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, video is required. It will be paid for by each camera 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 "VIVDS Processor System," "VIVDS Camera Assembly" of the various types, "VIVDS Central Control Software," "VIVDS Temporary," "VIVDS Cabling," and "VIVDS Video 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 communications 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 vehicle detection system.

6.2. **Install Only**. The work performed and materials furnished in accordance with this Item will be paid for at the unit bid price for "VIVDS Processor System (Install Only)," "VIVDS Camera Assembly (Install Only)," "VIVDS Temporary (Install Only)," and "VIVDS Cabling (Install Only)." This price is full compensation for installing,

configuring, integrating, and testing the completed installation, including VIVDS 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 bid price for "VIVDS Processor System (Relocate)," "VIVDS Camera Assembly (Relocate)," "VIVDS Temporary (Relocate)," and "VIVDS 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 bid price for "VIVDS Processor System (Remove)," "VIVDS Camera Assembly (Remove)," "VIVDS Temporary (Remove)," and "VIVDS 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 6007
Battery Back-Up System for Signal Cabinets

1. DESCRIPTION

Install a battery back-up (BBU) system for traffic signals that provides reliable emergency power in case of utility power failure or interruption. The BBU system should also function as a power conditioner or voltage regulation device.

The BBU system should consist of inverter/charger, manual bypass switch, power transfer switch or automatic bypass switch, batteries, battery monitoring device, wiring, external cabinet or stand-alone cabinet, concrete pad, all necessary hardware and software, and any associated equipment required to operate in a field environment.

The BBU system should be able to operate a light-emitting diode- (LED-) only signalized intersection (700-W load) for 4 hr. of full runtime when utility power is disabled and under ambient temperature of 25°C. The BBU system should switch the intersection to flash mode of operation when approximately 40% of battery charge is remaining, using relay contact connection points on the front panel of the unit. The BBU system should operate the intersection in the flash mode of operation (300-W load) for an additional 2 hr. BBU system components must be rated for a minimum 1,400-W load capacity.

Design the BBU system for outdoor applications in accordance with NEMA TS2-2003, Section 2. All components of the BBU system should be rated to operate under temperature extremes of -34°C–+74°C.

2. DEFINITIONS

2.1. **Automatic Bypass Switch**. A unit connected between the utility power supply and the inverter/charger that can automatically switch power to the controller cabinet service panel from inverter output power to utility line power.

2.2. **BBU System**. Includes, but is not limited to, a manual bypass switch, automatic bypass switch or power transfer switch, inverter/charger, batteries, battery monitoring device, wiring, external cabinet, and any necessary hardware for system operation.

2.3. **BBU System Software**. All software associated with operation, programming, and functional requirements of the BBU system.

2.4. **Battery Monitoring Device**. The device that monitors battery temperatures and charge rate of the batteries used in the BBU system.

2.5. **Batteries**. Standard 12-V batteries wired in series to create 36-V DC – 96-V DC storage.

2.6. **Boost**. When enabled, the BBU system inverter/charger should automatically switch into this mode to raise the utility line voltage when it drops below a preset limit. The limit may be user-defined or use manufacturer default settings (typically 100 V AC).

2.7. **Buck**. When enabled, the unit should automatically switch into this mode to reduce the utility line voltage when it rises above a preset limit. The limit may be user-defined or use manufacturer default settings (typically 135 V AC).

2.8. **External or Stand-Alone Cabinet**. The structure that houses the system components or batteries.

2.9. **Inverter/Charger**. The unit that converts the DC voltage input into 120-V AC output for the traffic signal cabinet to operate. At minimum, the inverter/charger should be rated for 1,400 W.

2.10. **Inverter Line Voltage**. The power supplied from the BBU system inverter to the traffic signal cabinet.

2.11. **Manual Bypass**. Manual switch that allows user to bypass BBU power to service system equipment. The manual bypass switch switches utility line power directly to cabinet.

2.12. **Power Transfer Switch**. A unit connected between the utility power supply and the inverter/charger that can automatically switch from utility line power to inverter output power. The power transfer relay may be a separate unit or combined with the manual bypass switch. In case of battery voltage loss, the power transfer switch must automatically return to utility line power.

2.13. **Signal Operation Mode**. A signalized intersection generating a 700-W load when running in normal operation.

2.14. **Signal Flash Mode**. A signalized intersection generating a 300-W load when running in the flash mode of operation.

2.15. **Utility Line Voltage**. The 120-V AC power supplied to the BBU system.

3. EQUIPMENT

Ensure electrical materials and construction methods conform to NEC and additional local utility requirements. Furnish BBU systems prequalified by the Department. The Traffic Operations Division maintains an MPL of prequalified BBU systems. Ensure all materials and construction methods conform to the details shown on the plans, this Specification, and the pertinent requirements of the following Items.

- Item 420, “Concrete Substructures”
- Item 620, “Electrical Conductors”

Provide and install a BBU system that can fulfill the following requirements.

3.1. **Method of Operation**. The BBU system should operate using one or more of the following methods.

3.1.1. **Buck-and-Boost Method**. When the buck-and-boost functions are enabled, they should set the upper and lower control limit allowable for the utility line voltage.

If the utility line voltage fluctuates above or below the buck-and-boost values, the BBU system should raise or lower the voltage by approximately 10%–15% of the utility line voltage to bring the voltage back within the upper and lower control limits. Provide a buck-and-boost system with preset manufacturer defaults.

If the utility line voltage falls above or below the functional capabilities of buck and boost, then the BBU system must transfer power from the utility line voltage to the inverter line voltage.

3.1.2. **Standby Method**. The standby method should set upper and lower control limits for the utility line power. If the utility line voltage falls above or below the upper or lower control limits, then the BBU system should transfer power from the utility line voltage to the inverter line voltage.

3.1.3. **Continuous Operating Mode, Double Conversion Method**. The continuous method always supplies the cabinet with inverter line voltage. This method requires the disabling of buck-and-boost functions.

3.2. **BBU System Capabilities**. The BBU system should be able to provide 1,400-W peak load, with at least 80% inverter efficiency, for at least 10 sec.

The BBU system should be able to provide 700-W signal operation load for at least 4 hr., and then switch to and provide 300-W signal flash load for an additional 2-hr. minimum, when batteries are fully charged.

When the BBU system runs on battery power, the inverter/charger should enable a user to select the voltage at which the transition from normal operating load to flash mode occurs (usually 47.5 V), using relay contacts and connection points on the front panel of the inverter/charger.

The allowed transfer time, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, should be less than 65 milliseconds. The same allowable transfer time must also apply when switching from inverter line voltage to utility line voltage.

The BBU system should bypass utility line voltage whenever the voltage is outside the manufacturer's default, or a user-programmed voltage range, ±2 V AC.

When the utility line power has been restored to a normal operating voltage for more than a user-defined setting (default 30 sec.), the BBU system should transfer from inverter line voltage to utility line voltage. The BBU system should be equipped to prevent malfunction feedback to the cabinet or the utility service.

Provide a BBU system that is compatible with TS1, TS2, and Model 170/2070 controllers and cabinet components for full runtime operation.

Unless the plans indicate otherwise, provide a BBU system in an external battery cabinet. When indicated by the plans, provide a BBU system that can be shelf-mounted in NEMA TS-1 and NEMA TS-2 cabinets, or rack-mounted for Model 170/2070 332 cabinets. Provide a manual bypass that can be shelf-mounted or attached to the side of the signal cabinet. Provide interconnect cables that are no less than 10 ft. long.

Relay contact wiring for each set of NO/NC relay contact closure terminals should be no less than 6 ft. long and #18 AWG wire. Use manufacturer recommendations for size of wire for any cable's lengths greater than 10 ft.

The BBU system should have lightning surge protection compliant with IEEE/ANSI C 62.41 and UL 1449. Provide lightning surge protection to the utility line voltage entering the inverter/charger. The surge protection device should be easily accessible and mounted externally from the inverter/charger.

The BBU system, including batteries and hardware, should be easily replaceable and should not require any special tools for installation.

The BBU system should operate in automatic fail-safe mode. Should a breaker trip the inverter/charger or power transfer switch on, the system must automatically operate from utility line power and bypass the BBU system.

As stated above, in addition to the inverter/charger, provide BBU with an external manual bypass switch and either an external automatic transfer switch or external automatic bypass switch.

The BBU system must be able to log up to 100 events. Events should date- and time-stamp faults with utility line voltage and battery voltages. At a minimum, the BBU system should log an event when:

- the utility line voltage falls above or below the upper or lower control limits,
- the BBU system automatically switches to battery power, or
- self-monitoring BBU system components fail.

3.3. **Displays, Controls, Diagnostics, and Maintenance**. The BBU system should include a front panel display. All applicable programmable functions of the operational methods described in this Specification should be viewable from the front panel display.

All events described in Section 3.2., "System Capabilities," should be viewable from the front panel display.

The BBU system software should be programmable from the front panel of the inverter/charger using a keyboard or momentary buttons, allowing user to step through menu-driven software.

Provide a 10/100 Ethernet port on the front panel of the inverter/charger.

Provide a RS232 port on the front panel of the inverter/charger.

Include software for the BBU system's operational needs. The user/operator should be able to access the system software via the Ethernet and RS232 ports on the front panel of the inverter/charger. The user should be able to read logged events and change programmable parameters from the keyboard, laptop, or local area network by the Ethernet port.

System software must be upgradeable by the RS232 port on the front panel of the inverter/charger.

3.4. **Inverter/Charger**. The inverter/charger is the unit that provides voltage regulation, conditioning of utility line power, DC voltage input conversion into 120-V AC output for the traffic signal cabinet to operate, emergency backup power upon loss of utility power, and temperature-compensated battery charging. At a minimum, the inverter/charger should be rated for 1,400 W. Provide at least six sets of Normally Open (NO) and Normally Closed (NC) single-pole double-throw dry contact relay closures on the front face of the inverter/charger, labeled to identify each contact. The relay closures should consist of NO/NC contact closures energized whenever the unit switches to battery power (label or mark contacts as "on battery" or equivalent), and a second set of NO/NC contact closures should be energized whenever the battery approaches 40% remaining capacity (label or mark contact as "low battery" or equivalent), which must determine when the unit will switch from normal operation to flash. A third set of NO/NC contact closures should be energized after a user-settable time after the unit switches to battery power. The contact may be labeled "timer." The remaining relays should be user-definable.

Operating temperature range for the inverter/charger and power transfer relay should be -34°F–+74°F. When battery power is used, the BBU system output voltage must be between 110 V AC and 125 V AC, pure sine wave output, ≤3% THD, 60 Hz ±3 Hz.

3.5. **Manual Bypass Switch**. The manual bypass switch should be provided as a separate unit external to the inverter/charger unit. The manual bypass switch must consist of housing, two-position switch, terminal blocks, internal wiring, service outlet, circuit breakers, and mounting hardware. The components should be rated at least 240 V AC/30 A. Provide the manual bypass switch with No. 8 terminal blocks. The manual bypass switch should be two-position and allow the user to switch utility line power directly to the cabinet service panel. The switch positions must provide the following functions.

- In the "Bypass" position, the inverter is bypassed, and utility power is removed from the BBU and passed directly to the signal power panel.
- In the "UPS" position, the inverter/switch is powered, and the signal circuits are supplied by the output of the inverter.

When the manual bypass switch is in the "Bypass" position, the user may replace the automatic bypass switch (or transfer switch) and the inverter/charger without interrupting power to the intersection. Provide the manual bypass switch with overcurrent protection (20-A circuit breaker).

3.6. **Power Transfer Switch**. These requirements are for BBU systems provided with a power transfer switch. The power transfer switch must operate such that the inverter/charger input and cabinet power panel are supplied with power from the utility line. If the utility line power is lost or requires conditioning (buck or boost), the power transfer switch must automatically connect the inverter/charger output to the cabinet power panel such that the inverter/charger output provides the power. In case of inverter/charger failure, battery failure, or complete battery discharge, the power transfer should revert to the NC (de-energized) state, where utility line power is connected to the cabinet service panel.

Size the wire going to the power transfer switch from the manual bypass switch, to and from the inverter/charger, and from the manual bypass switch to utility power service according to the system requirements.

3.7. **Automatic Bypass Switch**. These requirements are for BBU systems provided with an automatic bypass switch. The automatic bypass switch must operate such that the inverter/charger input is supplied with power from the utility line and the cabinet power panel is supplied with power from the output of the inverter/charger. In case of inverter/charger failure, battery failure, or complete battery discharge, or other loss of power from the output of the inverter/charger, the automatic bypass switch should revert to the NC (de-energized) state, where utility line power is connected to the cabinet service panel.

3.8. **Batteries**. Provide batteries from the same manufacturer and vendor as the BBU system.

Individual batteries should be 12-V type, easily replaceable, and available for purchase, or common off-the-shelf equivalent.

Select batteries sized and rated to operate a 700-W load for 4 hr. (normal operation) followed by a 300-W load for 2 hr. (flash operation), for a total of 6 hr.

Battery configuration should consist of 12-V batteries arranged for total voltages of 36, 48, 60, 72, 84, or 96.

Batteries should be deep-discharge, sealed prismatic lead-calcium based, valve-regulated, and maintenance-free.

Batteries should operate over a temperature range of -34°F–+74°F.

Batteries should indicate maximum recharge data and recharging cycles, and manufacturer defaults on the inverter/charger should not allow the recharging process to exceed the batteries' maximum values.

Connect the battery interconnect wiring to the inverter unit using a modular harness with red and black cabling that terminates into a typical power-pole style connector. Equip the harness with mating power flag-style connectors for batteries and a single insulated plug-in style connection to inverter/charger unit. Harness should allow batteries to be quickly and easily connected in any order, and keyed to ensure proper polarity and circuit configuration. Size the fusible link or device accordingly with BBU system requirements. To protect against currents exceeding each battery current rating, provide links within 3 in. of the negative and positive leads of each battery. Provide fusible links made of insulated stranded wire.

Provide insulated covers at the connection points (posts) to prevent accidental shorting.

Provide battery cables to connect battery to battery harness main cable at least 18 in., or long enough to accommodate the battery covers provided with the battery ground box, whichever is longer. Size the battery harness accordingly with BBU system requirements.

3.9. **Battery Monitoring System**. The BBU system should use a temperature-compensated battery charging system. The charging system should compensate over 2.5 mV/°C–4.0 mV/°C per cell.

Use a temperature sensor to monitor the temperature and regulate the charge rate of the batteries. Unless required otherwise by the plans, provide a temperature sensor wire as follows.

- 8 ft. long if external side-mounted cabinet is attached to existing controller cabinet
- 8 ft. long if batteries are housed in traffic signal base used for cabinet foundation and are stored on shelf within base
- 8 ft. long if a stand-alone cabinet is used

Should the temperature sensor fail, the inverter/charger should not allow the BBU system to overcharge the batteries. The BBU system should provide an alarm should the temperature sensor fail.

Recharge time for the batteries to obtain 80% or more of full battery charge capacity should not exceed 20 hr. at 70°F.

Batteries should not be allowed to charge when the battery temperature exceeds 50°F.

The BBU system should monitor battery strings within a system and set a fault indicator if the battery voltage falls below normal operating voltage.

3.10. **Battery Housing**. Unless plans require otherwise, provide an external battery cabinet or stand-alone BBU and battery cabinet as specified below.

3.10.1. **External Battery Cabinet**. The external cabinet should be NEMA Type 3R all-aluminum with stainless steel hardware, or approved equivalent. Design the external cabinet to attach on the side of a TS2 Size 6 base-mount cabinet. Mount the batteries, inverter, transfer switches, manual bypass, and associated hardware in the external cabinet.

Equip the external cabinet with proper ventilation, electric fan, and air filter in accordance with NEMA TS2.

Equip external cabinets with a door opening to the entire cabinet. Attach the door to the cabinet with a full-length stainless steel piano hinge or four two-bolts-per-leaf hinges. Provide a door with the same latch and lock mechanism as required for a standard traffic signal cabinet. In addition, provide a padlock clasp.

When using battery ground boxes, an external cabinet is required for the non-battery components.

3.10.2. **Stand-Alone BBU and Battery Cabinet**. When required for installation by the plans, provide a stand-alone cabinet conforming to the specifications of the external BBU and battery cabinet, except that it must not mount to the controller cabinet. Design the stand-alone cabinet to attach to a concrete pad.

3.11. **Concrete Pad**. Provide a Class B concrete pad as a foundation for stand-alone cabinets. For external cabinets, extend the controller foundation to provide a Class B concrete pad under the external cabinet.

3.12. **Documentation**. Provide operation and maintenance manuals. The operation manual should include a block diagram schematic of system hardware components. The manual should include instructions for programming and viewing software features. The manual should also include uploading and downloading (communications protocol) requirements by RS232 or Ethernet port.

Provide board-level schematics when requested.

Provide battery documentation and replacement information.

3.13. **Testing**. The Department reserves the right to test BBU systems to ensure quality assurance on unit before installation and random sampling of units being provided to the State. BBU systems that fail must be removed from the Qualified Products List (QPL).

Department QPL testing procedures must check compliance with the criteria of this Specification, including the following.

- Event logging for fault and alarm conditions
- Demonstrated use of one or more of the operating methods described in Section 3.1., “Method of Operation”
- Testing of ability to power a 700-W load for 4 hr., transfer to flash mode, and power a 300-W load for additional 2 hr., at an ambient temperature of +75°F
- Testing of all components in environmental chamber (temperature ranges from -30°F–+74°F) following NEMA TS2 2003, Section 2.

3.14. **Warranty, Maintenance, and Support**. Provide a BBU with a warranty that requires the manufacturer to replace failed BBUs when non-operable due to defect in material or workmanship within 5 yr. of date of purchase from manufacturer. Supply a BBU with no less than 95% of the manufacturer’s warranty remaining on the date when the BBU is installed and begins operating. The replacement BBU must meet this Specification. The Contractor must manage any warranty issues until the date of final acceptance.

Batteries should be warranted for full replacement for 5 yr. Batteries must be defined as bad if they are not able to deliver 80% of battery rating.

4. MEASUREMENT

This Item will be measured by each BBU system installed.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "BBU System" of the type of BBU cabinet specified. This price is full compensation for furnishing, installing, and testing the completed BBU system and associated equipment; mounting hardware; Class B concrete pad; software; conduit; conductors; and equipment, labor, tools, and incidentals.

Special Specification 6008

Radar Vehicle Detection System for Signalized Intersection Control

1. DESCRIPTION

Furnish, install, relocate, or remove radar vehicle detection systems (RVDS) of the specified devices at signalized intersections to provide the required zones of detection as shown on the plans, or as directed.

2. MATERIALS

2.1. **General**. Except as allowed for relocation of RVDS equipment, ensure all equipment and component parts are new in accordance with Division Specification TO-8000, "Radar Vehicle Detection System," Section 1.0–Section 6.0, and in an operable condition at time of delivery and installation.

The Traffic Safety Division, Traffic Management Section, (TRF-TM) updates TxDOT Material producer list (MPL) of all RVDSs conforming to this Specification. New materials appearing on the MPL require no further sampling and testing before use unless deemed necessary by the Engineer or TRF-TM. Provide prequalified RVDSs from the TxDOT MPL.

Ensure all RVDSs serving the same detection purpose within the project are from the same manufacturer. RVDS devices are classified by their functional requirements. The functional requirements are for radar presence detection devices (RPDDs) and radar advance detection devices (RADDs). The RVDS system classifications are RVDS (RPDD Only), RVDS (RADD Only), and RVDS (RPDD and RADD).

Provide each RVDS sensor with a mounting bracket designed to mount directly to a pole, mast arm, or other structure. Ensure bracket is designed such that the sensor can be tilted vertically and horizontally for alignment and then locked into place after proper alignment is achieved. All hardware must be designed to support the load of the RVDS sensor and mounting bracket.

2.2. **Configuration**. Ensure the RVDS provides vehicle detection as required on the plans, or as directed.

Ensure the RVDS does not require tuning or recalibration to maintain performance once initial calibration and configuration are complete. RVDS must not require cleaning or adjustment to maintain performance.

RVDS must self-recover from power failure once power is restored.

2.3. **Cabling**. Provide appropriate length of all cables necessary to make the RVDS fully operational at each installation site.

2.4. **Software**. Ensure the RVDS manufacturer includes all software required to configure and monitor operation of RVDS field equipment locally and remotely. RVDS software must be a stable production release.

Software must allow the user to configure, operate, exercise, diagnose, and read status of all RVDS features and functions using a laptop computer.

Software must include the ability to save a local copy of RVDS field device configurations and load saved configurations to RVDS field devices.

Ensure all licenses required for operation and use of software are included at no additional cost.

Software updates must be provided at no additional cost during the warranty period.

2.5. **Electrical**. All conductors supplying the equipment must meet NEC requirements.

Ensure equipment is designed to protect personnel from exposure to high voltage during installation, operation, and maintenance.

2.6. **Mechanical**. Ensure that all parts are fabricated from corrosion-resistant materials, such as plastic, stainless steel, aluminum, or brass.

Ensure that all screws, nuts, and locking washers are corrosion-resistant. Do not use self-tapping screws.

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

Ensure RVDS is modular in design for ease of field replacement and maintenance. Provide a sensor that will minimize weight and wind loading when mounted on a traffic signal pole or mast arm.

All printed circuit boards must have conformal coating.

2.7. **Environmental**. RVDS sensor must be able to withstand the maximum wind load based on the Department's basic wind velocity zone map standard without any damage or loosening from structure.

The RVDS enclosure must conform to criteria set forth in NEMA 250 for Type 4X enclosures.

The RVDS must meet all NEMA TS2 environmental requirements for temperature, humidity, transients, vibration, and shock.

2.8. **Connectors and Harnesses**. Ensure all conductors are properly color-coded and identified.

Ensure cable connector design prohibits improper connections. Cable connector pins are plated to improve conductivity and resist corrosion.

Connections for data and power must be made to the RVDS sensor using waterproof, quick-disconnect connectors. Pigtails from the sensor to a waterproof junction box (NEMA 4) or an approved waterproof connector must be allowed for splicing. The pigtails must not be shorter than 3 ft. unless otherwise shown on the plans.

3. CONSTRUCTION

3.1. **System Installation**. Install RVDS system devices according to the manufacturer's recommendations to provide properly functioning detection as required. This must include the installation of sensors on signal poles or mast arms, controller interface modules, power and surge protection panels, cabling and all associated equipment, software, serial and Ethernet communication ports, and connectors and hardware required to set up and operate. Ensure that the supplier of the RVDS provides competent onsite support representative during installation to supervise installation and testing of the RVDS. Ensure the radar sensor locations are optimal for system operation and operate as required. Maintain safe construction practices during equipment installation.

Ensure installation and configuration of software on Department computers are included with the RVDS.

Take care to prevent damage to any support structures. Any equipment or structure damaged or lost must be replaced by the Contractor (with items approved) at no cost to the Department.

3.2. **Mechanical Components**. Ensure that all fasteners, including bolts, nuts, and washers with a diameter less than 5/8 in. are Type 316 or Type 304 stainless steel and meet ASTM F593 and ASTM F594 for corrosion

resistance. Ensure that all bolts and nuts 5/8 in. and more in diameter are galvanized and meet ASTM A307. Separate dissimilar metals with an inert dielectric material.

3.3. **Wiring**. Install all wiring and electrical work supplying power to the equipment in a neat, skillful manner. Supply and install all wiring necessary to interconnect RVDS sensors to the traffic signal cabinet to complete the work. Furnish and install any additional required wiring at no additional cost to the Department.

Wiring must be cut to proper length before installation. Provide cable slack for ease of removal and replacement. All cable slack must be neatly laced with lacing or straps in the bottom of the cabinet. Ensure cables are secured with clamps.

3.4. **Grounding**. Ensure all RVDS components, cabinets, and supports are grounded in accordance with the NEC and manufacturer recommendations.

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

Inspect the existing RVDS field equipment with a representative from the Department and document any evidence of damage 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 RVDS field equipment, disconnect and isolate the power cables from the electric power supply and disconnect all communication cabling from the equipment located inside the cabinet. Coil and store power and communication cabling inside the cabinet until relocation. Remove existing RVDS field equipment as shown on the plans only when authorized.

Take care to prevent damage to any support structures. Any equipment or structure damaged or lost must be replaced by the Contractor (with items approved) at no cost to the Department.

Make all arrangements for connection to the power supply and communication source, including any permits required for the work under the Contract. Provide wire for the power connection at least the minimum size indicated on the plans and insulated for 600 V. Meet the NEC.

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

Disconnect and isolate any existing electrical supply before removal of existing field equipment.

Take care to prevent damage to any support structures. Any equipment or structure damaged or lost must be replaced by the Contractor (with items approved) at no cost to the Department.

All materials not designated for reuse or retention by the Department will become the property of the Contractor and be removed from the project site at the Contractor's expense. Deliver items to be retained by the Department to a location shown on the plans or General Notes. The Contractor is fully responsible for any removed equipment until released.

3.7. **Documentation**. Provide electronic copies of operation and maintenance manuals, along with a copy of all product documentation on electronic media. Include the following documentation.

- Complete and accurate schematic diagrams
- Complete installation procedures
- Manufacturer's specifications (functional, electrical, mechanical, and environmental)
- Complete maintenance and troubleshooting procedures

- Explanation of product operation
- Warranty as specified in Section 3.8., "Warranty"

The RVDS must pass testing to ensure functionality and reliability before delivery. This includes functional tests for internal subassemblies, a 24-hr. minimum unit level burn-in test, and a unit functionality test. Provide test results and supporting documentation, including serial number tested, for each RVDS. If requested, manufacturing data per serial number must be provided for each RVDS.

Unless deemed unnecessary by the Engineer or TRF-TM, provide certification from an independent laboratory demonstrating compliance with NEMA TS2 environmental requirements for temperature, humidity, transients, vibration, and shock.

Unless deemed unnecessary by the Engineer or TRF-TM, provide third-party enclosure test results demonstrating the sensor enclosure meets Type 4X criteria.

Unless deemed unnecessary by the Engineer or TRF-TM, provide evidence of RVDS manufacturer's quality assurance program, including proof of RVDS manufacturer ISO 9001 certification or other quality management system programs for manufacturing RVDS.

3.8. **Warranty**. Ensure that the detection system has a manufacturer's warranty covering defects for at least 5 yr. from the date of final acceptance. In addition to the terms required by TO-8000, Article 8, ensure the warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department.

3.9. **Training and Support**. Provide manufacturer-approved end user training to the Department and their representatives. Training must include instruction in system configuration, operation, and maintenance. Provide training for at least 10 Department-designated representatives up to 8 hr., including class and field training.

Ensure that the detection system manufacturer will provide product support for at least 5 yr. from the date of final acceptance.

4. TESTING

Perform the following tests on equipment and systems unless otherwise shown on the plans. The Department may witness all the tests.

4.1. **Stand-Alone Test**. Conduct a stand-alone test for each unit after installation. The test must exercise all stand-alone (non-network) functional operations and verify that RVDS is placing detector contact closure to assigned detector channels in the traffic signal controller assembly. Notify the Engineer 5 working days before conducting this test.

4.2. **Consequences of Test Failure**. If a unit fails a test, provide a new unit, and then repeat the test until successfully completed.

4.3. **Final Acceptance Test**. Conduct a final acceptance test on the complete functional system. Demonstrate all control, monitoring, and communication requirements and operate the system for 30 days. The Engineer will furnish a letter of approval stating the first day of the final acceptance test.

4.4. **Consequences of Final Acceptance Test Failure**. If a defect within the system is detected during the final acceptance test, document and correct the source of failure. Once corrective measures are taken, monitor the point of failure until a consecutive 30-day period free of defects is achieved.

4.5. **Relocation**.

4.5.1. **Pre-Test**. Provide five copies of the test procedures, including tests of the basic functionality of the unit, and blank data forms to the Engineer for review and comment as part of material documentation requirements. Functionality tests may include, but not be limited to, physical inspection of the unit and cable assemblies. Include the sequence of the tests in the procedures along with acceptance thresholds. The Engineer will comment on and approve or reject test procedures within 30 days after Contractor submittal of test procedures. Rejected test procedures must be resubmitted within 10 days. Review time is in calendar days. Conduct all tests in accordance with the approved test procedures.

Conduct basic functionality testing before removal of RVDS field equipment. Test all functional operations of the equipment in the presence of representatives of the Contractor and the Department. Ensure that both representatives sign the test report indicating that the equipment has passed or failed each function. Once removed, the equipment will become the responsibility of the Contractor until accepted by the Department. Compare test data prior to removal and after installation. The performance test results after relocation must be equal to or better than the test results before removal. Repair or replace the failing components within the systemso that the system can pass the performance test after relocation.

4.5.2. **Post-Test**. Testing of the RVDS field equipment is to relieve the Contractor of system maintenance. The Contractor will be relieved of the responsibility for system maintenance in accordance with Item 7, “Legal Relations and Responsibilities,” after a successful test period. The Contractor will not be required to pay for electrical energy consumed by the system.

After all existing RVDS field equipment has been installed, conduct approved continuity, stand-alone, and performance tests. Furnish test data forms containing the sequence of tests, including all the data taken as well as quantitative results for all tests. Submit the test data forms to the Engineer at least 30 days 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 with all the equipment installed per the plans as directed. Complete the approved data forms with test results and submit them to the Engineer for review and either acceptance or rejection of equipment. Give at least 30 working days’ notice before all tests to allow the Engineer or their representative to observe each test.

The Department must conduct approved RVDS field equipment system tests on the field equipment with the central equipment. The tests must, at minimum, exercise all remote-control functions and display the return status codes from the controller.

If any unit fails to pass a test, prepare and deliver a report to the Engineer. Describe the nature of the failure and the corrective action needed. If the failure is the result of improper installation or damage during reinstallation, reinstall or replace the unit and repeat the test until the unit passes successfully, at no additional cost to the Department or extension of the Contract period.

5. MEASUREMENT

New RVDSs furnished and installed by the Contractor will be measured by each approach to the signalized intersection.

RVDSs furnished by the Department for Contractor installation only will be measured by each approach to the signalized intersection.

Existing RVDSs to be relocated or removed will be measured by each sensor relocated or removed.

6. PAYMENT

6.1. **Furnish and Install**. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit bid price for "RVDS (Presence Detection Only)," "RVDS (Advance Detection Only)," and "RVDS (Presence and Advance Detection)."

This price is full compensation for furnishing, installing, configuring, integrating, and testing the completed installation, including RVDS equipment, voltage converters or injectors, cables, connectors, associated equipment, and mounting hardware. This price also fully compensates for all labor, tools, equipment, any required equipment modifications for electrical service, documentation, testing, training, software, warranty, and incidentals necessary to complete the work.

6.2. **Install Only**. The work performed and materials furnished in accordance with this Item will be paid for at the unit bid price for "RVDS (Presence Detection Only) (Install Only)," "RVDS (Advance Detection Only) (Install Only)," and "RVDS (Presence and Advance Detection) (Install Only)."

This price is full compensation for making fully operational an RVDS furnished by the Department; for installing, configuring, integrating, and testing the completed installation, including RVDS equipment, voltage converters or injectors, cables, connectors, associated equipment, and mounting hardware; and for all labor, tools, equipment, any required equipment modifications for electrical service, documentation, testing, training, software, and incidentals necessary to complete the work.

6.3. **Relocate**. The work performed and materials furnished in accordance with this Item will be paid for at the unit bid price for "Relocate RVDS." This price is full compensation for relocating and making fully operational existing RVDS field equipment; for furnishing and installing additional cables or connectors; for testing, delivery, and storage of components designated for salvage or reuse; and for all testing, training, software, equipment, any required equipment modifications for electrical service, labor, materials, tools, and incidentals necessary to complete the work.

6.4. **Remove**. The work performed and materials furnished in accordance with this Item will be paid for at the unit bid price for "Remove RVDS." This price is full compensation for removing existing RVDS equipment; for removal of cables and connectors; for testing, delivery, and storage of components designated for salvage; and for all testing, training, software, equipment, labor, materials, tools, and incidentals necessary to complete the work.

6.5. **Communication Cable**. All communication cables necessary to make the RVDS fully operational will be subsidiary to this Item.

Special Specification 6013
Preparation of Existing Ground Boxes and Manholes

1. DESCRIPTION

Prepare ground boxes or manholes; replace ground boxes or manholes, when necessary; replace damaged ground box or manhole covers; adjust ground boxes; adjust ground box or manhole covers; and install cable racks in ground boxes or manholes.

2. MATERIALS

Provide new materials that comply with the plans, this Item, and the pertinent requirements of the following Items.

- Item 432, “Riprap”
- Item 440, “Reinforcement for Concrete”
- Item 465, “Junction Boxes, Manholes and Inlets”
- Item 624, “Ground Boxes”

Provide heavy-duty, nonmetallic, noncorrosive cable racks that can support a minimum dead load of 300 lb. Ensure cable racks are resistant to the effects of oils, hydrocarbons, common esters, ketones, ethers, or amides. Ensure cable racks are adjustable between 8 in. and 14 in. wide. Do not provide grounding or insulators for cable racks.

3. CONSTRUCTION

Check existing ground boxes.

3.1. **Preparation of Ground Box and Manhole**. Remove silt and debris from ground boxes or manholes before installing cable.

3.2. **Installation of Ground Box or Manhole**. Furnish new ground boxes or manholes as directed. Install ground boxes or manholes as shown on the plans or as directed.

Backfill disturbed surface with material equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

3.3. **Installation or Adjustment of Ground Box or Manhole Covers**. Remove, dispose of, and install ground box or manhole covers as shown on the plans or as directed. Adjust ground box or manhole covers as shown on the plans or as directed. Adjustment may include welding, raising, or lowering.

Backfill disturbed surface with material equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

3.4. **Installation of Junction Box**. Locate conduit fittings in conduits carrying fiber optic cables. Replace the conduit fitting and associated section of conduit with a junction box. Install junction boxes as shown on the plans.

3.5. **Installation of Cable Rack Assembly**. Install cable racks to permit coiling of conductors or cables without violating the manufacturer’s minimum bending radius. Install two cable rack supports and four adjustable levels on each support, at minimum, on each wall of the ground box or manhole as shown on the plans or as directed. Anchor the cable rack support permanently to the ground box wall with mechanical or

powder-actuated fasteners. Use fasteners with an ultimate pullout strength of at least 2,500 lb. and ultimate shear strength of at least 3,000 lb. Provide enough cable supports for the number of conductors or cables coiled or passing through the ground box or manhole as shown on the plans or as directed.

3.6. **Adjustment of Ground Boxes**. Adjust ground boxes to meet new elevation of surface as shown on the plans or as directed. Remove existing concrete apron before adjustment, as necessary. Adjust length of conduit and conductors as needed. Backfill disturbed surface with material equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

Protect existing conduits and conductors inside the ground box from damage. Replace ground box, conductor, or ground box cover damaged by the Contractor.

Construct concrete aprons (as required) as shown on the plans and in accordance with Item 432 and Item 440.

Accept ownership of any unsalvageable materials, and dispose of them in conformance with federal, state, and local regulations.

4. MEASUREMENT

This Item will be measured by each cable rack, ground box, or manhole installed or prepared; by each ground box or manhole cover replaced or adjusted; and by each ground box adjusted.

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 "Manhole (Install)," "Ground Box (Install)," "Manhole (Prepare)," "Ground Box (Prepare)," "Cover (Replace)" of the sizes specified, "Cover (Adjust)," "Ground Box (Adjust), "Ground Box with Apron (Adjust)" and "Cable Rack Assembly (Install)." This price is full compensation for cleaning and testing ground boxes and manholes; furnishing and installing ground boxes, manholes, and cable racks; excavating and backfilling; adjusting ground box and manhole covers; adjusting ground boxes and installing new concrete aprons (when required); disposing of unsalvageable material; and equipment, materials, labor, tools, and incidentals.

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