Control	**3510-06-027**
Project	**C 3510-6-27**
Highway	**SH 99**
County	**HARRIS**

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	**3510-06-027**
Project	**C 3510-6-27**
Highway	**SH 99**
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PROPOSAL TO THE TEXAS TRANSPORTATION COMMISSION

2014 SPECIFICATIONS

WORK CONSISTING OF WIDEN ROAD - ADD LANES

HARRIS 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 939 working days and will be accepted when fully completed and finished to the satisfaction of the Executive Director or designee.

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

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

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

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

By signing the proposal the bidder certifies:

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

- **Signed: ****

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

Print Name:

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

Title:

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

Company:

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

- Signatures to comply with Item 2 of the specifications.

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

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

NOTICE TO CONTRACTORS

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

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

TEXAS DEPARTMENT OF TRANSPORTATION

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS,

That we, (Contractor Name) _____

_____

Hereinafter called the Principal, and (Surety Name) _____

_____

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

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

Control	**3510-06-027**
Project	**C 3510-6-27**
Highway	**SH 99**
County	**HARRIS**

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

Signed this _____ Day of _____ 20_____

By: _____

(Contractor/Principal Name)

_____

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

*By: _____

(Surety Name)

_____

(Signature of Attorney-in-Fact)

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

Impressed Surety Seal Only

This form may be removed from the proposal.

C U T H E R E

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BIDDER'S CHECK RETURN

IMPORTANT

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

NOTE

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

RETURN BIDDERS CHECK TO (PLEASE PRINT):

Control	**3510-06-027**
Project	**C 3510-6-27**
Highway	**SH 99**
County	**HARRIS**

IMPORTANT

PLEASE RETURN THIS SHEET IN ITS ENTIRETY

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

Check Received By: _____ Date:_____

Title: _____

For (Contractor's Name): _____

Project _____ County_____

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NOTICE TO THE BIDDER

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

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

$_____

Total Bid Amount

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

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

EXAMPLE

Total Bid Amount _____$2,664.00_____

Signed _____
Title _____
Date _____

Additional Signature for Joint Venture:

Signed _____
Title _____
Date _____

EXAMPLE OF BID PRICES SUBMITTED BY COMPUTER PRINTOUT

EXAMPLES

BID PRICES SUBMITTED BY HAND WRITTEN FORMAT

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

Unit price for each plant in place

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

Unit price for each ton of Flexible Base

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

Unit price for each cubic yard of Concrete

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

Unit price of each Roadway Illumination Assembly

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ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	100	6002		PREPARING ROW DOLLARS and CENTS	STA	304.000	1
	104	6001		REMOVING CONC (PAV) DOLLARS and CENTS	SY	13,253.000	2
	104	6009		REMOVING CONC (RIPRAP) DOLLARS and CENTS	SY	1,297.000	3
	104	6023		REMOVING CONC (CTB) DOLLARS and CENTS	LF	1,613.000	4
	104	6024		REMOVING CONC (RETAINING WALLS) DOLLARS and CENTS	SY	410.000	5
	104	6028		REMOVING CONC (MISC) DOLLARS and CENTS	SY	20.000	6
	104	6034		REMOVING CONC (COPING) DOLLARS and CENTS	LF	627.000	7
	104	6037		REMOVE CONC (RAIL) DOLLARS and CENTS	LF	5,727.000	8
	104	6054		REMOVING CONCRETE(MOW STRIP) DOLLARS and CENTS	LF	30,038.000	9
	105	6049		REMOVING STAB BASE & ASPH PAV (4"-22") DOLLARS and CENTS	SY	26,481.000	10
	110	6001		EXCAVATION (ROADWAY) DOLLARS and CENTS	CY	98,159.000	11
	110	6002		EXCAVATION (CHANNEL) DOLLARS and CENTS	CY	35,567.000	12

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	132	6006	002	EMBANKMENT (FINAL)(DENS CONT)(TY C) DOLLARS and CENTS	CY	13,246.000	13
	132	6007	002	EMBANKMENT (FINAL)(ORD COMP)(TY D) DOLLARS and CENTS	CY	2,132.000	14
	161	6017		COMPOST MANUF TOPSOIL (4") DOLLARS and CENTS	SY	31,615.000	15
	162	6002		BLOCK SODDING DOLLARS and CENTS	SY	190,134.000	16
	162	6003		STRAW OR HAY MULCH DOLLARS and CENTS	SY	78,498.000	17
	164	6009		BROADCAST SEED (TEMP) (WARM) DOLLARS and CENTS	SY	2,217.000	18
	164	6051		DRILL SEED (TEMP)(WARM OR COOL) DOLLARS and CENTS	SY	44,350.000	19
	164	6052		BROADCAST SEED (PERM)(SPECIAL MIX) DOLLARS and CENTS	SY	316.000	20
	164	6066		DRILL SEEDING (PERM)(WARM OR COOL) DOLLARS and CENTS	SY	31,615.000	21
	166	6001		FERTILIZER DOLLARS and CENTS	AC	55.500	22
	168	6001		VEGETATIVE WATERING DOLLARS and CENTS	MG	6,660.000	23
	247	6064	005	FL BS (CMP IN PLC)(TY A GR 4) (6") DOLLARS and CENTS	SY	28.000	24

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	247	6230	005	FL BS (CMP IN PLACE)(TY A GR 1-2)(8") DOLLARS and CENTS	SY	30.000	25
	260	6006		LIME TRT (EXST MATL) (6") DOLLARS and CENTS	SY	128,463.000	26
	260	6012		LIME(HYD,COM OR QK)(SLRY)OR QK(DRY) DOLLARS and CENTS	TON	1,734.250	27
	275	6001		CEMENT DOLLARS and CENTS	TON	1,734.250	28
	276	6224		CEM TRT(PLNT MX) (CL N)(TY E)(GR 4)(6") DOLLARS and CENTS	SY	128,463.000	29
	292	6017		ASPHALT STAB BASE (GR 4)(PG 64) DOLLARS and CENTS	TON	6,913.280	30
	360	6015	001	CONC PVMT (CONT REINF - CRCP) (12.5") DOLLARS and CENTS	SY	125,696.000	31
	360	6027	001	CURB (TYPE II) DOLLARS and CENTS	LF	160.000	32
	360	6097	001	CONC PVMT (JOINTED - CPCD) (12.25") DOLLARS and CENTS	SY	524.000	33
	400	6001		STRUCT EXCAV DOLLARS and CENTS	CY	3,602.300	34
	400	6004		STRUCT EXCAV (BRIDGE) DOLLARS and CENTS	CY	1,910.300	35
	400	6005		CEM STABIL BKFL DOLLARS and CENTS	CY	6,518.540	36

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	400	6009		CEMENT STAB BACKFILL (INLET OR MH) DOLLARS and CENTS	CY	462.800	37
	402	6001		TRENCH EXCAVATION PROTECTION DOLLARS and CENTS	LF	4,806.000	38
	403	6001		TEMPORARY SPL SHORING DOLLARS and CENTS	SF	11,438.000	39
	416	6001		DRILL SHAFT (18 IN) DOLLARS and CENTS	LF	180.000	40
	416	6003		DRILL SHAFT (30 IN) DOLLARS and CENTS	LF	2,901.000	41
	416	6004		DRILL SHAFT (36 IN) DOLLARS and CENTS	LF	2,984.000	42
	416	6005		DRILL SHAFT (42 IN) DOLLARS and CENTS	LF	1,486.000	43
	416	6012		DRILL SHAFT (84 IN) DOLLARS and CENTS	LF	476.000	44
	416	6020		DRILL SHAFT (SIGN MTS) (36 IN) DOLLARS and CENTS	LF	232.000	45
	416	6021		DRILL SHAFT (SIGN MTS) (42 IN) DOLLARS and CENTS	LF	660.000	46
	416	6025		DRILL SHAFT (HIGH MAST POLE) (54 IN) DOLLARS and CENTS	LF	1,050.000	47
	416	6029		DRILL SHAFT (RDWY ILL POLE) (30 IN) DOLLARS and CENTS	LF	154.000	48

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	420	6013	001	CL C CONC (ABUT) DOLLARS and CENTS	CY	184.200	49
	420	6019	001	CL C CONC (ABUT)(EXTEND) DOLLARS and CENTS	CY	198.600	50
	420	6029	001	CL C CONC (CAP) DOLLARS and CENTS	CY	316.700	51
	420	6037	001	CL C CONC (COLUMN) DOLLARS and CENTS	CY	449.900	52
	420	6043	001	CL C CONC (FOOTING) DOLLARS and CENTS	CY	175.200	53
	420	6068	001	CL C CONC (SIGN COLUMN) DOLLARS and CENTS	CY	232.700	54
	420	6071	001	CL C CONC (COLLAR) DOLLARS and CENTS	EA	6.000	55
	420	6133	001	CL A CONC (CHANNEL LINING) DOLLARS and CENTS	CY	1,223.200	56
	420	6134	001	CL C CONC (SIGN FOOTING) DOLLARS and CENTS	CY	73.800	57
	420	6182	001	CL F CONC (CAP)(INVT) DOLLARS and CENTS	CY	82.000	58
	422	6003		REINF CONC SLAB (EXTEND SLAB) DOLLARS and CENTS	SF	108,010.000	59
	425	6036	001	PRESTR CONC GIRDER (TX34) DOLLARS and CENTS	LF	607.500	60

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	425	6037	001	PRESTR CONC GIRDER (TX40) DOLLARS and CENTS	LF	691.220	61
	425	6038	001	PRESTR CONC GIRDER (TX46) DOLLARS and CENTS	LF	860.620	62
	425	6039	001	PRESTR CONC GIRDER (TX54) DOLLARS and CENTS	LF	7,311.200	63
	425	6040	001	PRESTR CONC GIRDER (TX62) DOLLARS and CENTS	LF	2,183.590	64
	432	6001		RIPRAP (CONC)(4 IN) DOLLARS and CENTS	CY	126.400	65
	432	6008		RIPRAP (CONC)(CL B)(RR8&RR9) DOLLARS and CENTS	CY	181.300	66
	432	6009		RIPRAP (CONC) (CL B) (4") DOLLARS and CENTS	CY	7.800	67
	432	6010		RIPRAP (CONC)(CL B)(5 IN) DOLLARS and CENTS	CY	23.500	68
	432	6026		RIPRAP (STONE COMMON)(DRY)(18 IN) DOLLARS and CENTS	CY	19.500	69
	432	6045		RIPRAP (MOW STRIP)(4 IN) DOLLARS and CENTS	CY	114.440	70
	450	6004	001	RAIL (TY T221) DOLLARS and CENTS	LF	1,900.000	71
	450	6023	001	RAIL (TY SSTR) DOLLARS and CENTS	LF	1,841.200	72

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	450	6054	001	RAIL (TY SSTR) (W/DRAIN SLOTS) DOLLARS and CENTS	LF	5,480.000	73
	450	6119	001	RAIL (CLF-RO) DOLLARS and CENTS	LF	224.000	74
	454	6018		SEALED EXPANSION JOINT (4 IN) (SEJ - M) DOLLARS and CENTS	LF	879.700	75
	460	6003		CMP (GAL STL 24 IN) DOLLARS and CENTS	LF	55.000	76
	464	6003	001	RC PIPE (CL III)(18 IN) DOLLARS and CENTS	LF	25.000	77
	464	6005	001	RC PIPE (CL III)(24 IN) DOLLARS and CENTS	LF	4,449.000	78
	464	6008	001	RC PIPE (CL III)(36 IN) DOLLARS and CENTS	LF	32.000	79
	464	6012	001	RC PIPE (CL III)(60 IN) DOLLARS and CENTS	LF	12.000	80
	465	6007	001	JCTBOX(COMPL)(PJB)(3FTX5FT) DOLLARS and CENTS	EA	1.000	81
	465	6170	001	INLET (COMPL)(TY AZ) DOLLARS and CENTS	EA	2.000	82
	465	6173	001	MANH (COMPL)(TY A) DOLLARS and CENTS	EA	4.000	83
	465	6177	001	INLET (COMPL)(TY AZ2G) DOLLARS and CENTS	EA	40.000	84

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	465	6196	001	INLET (COMPL)(TY A)(SPL) DOLLARS and CENTS	EA	1.000	85
	467	6362		SET (TY II) (18 IN) (RCP) (6: 1) (C) DOLLARS and CENTS	EA	2.000	86
	467	6390		SET (TY II) (24 IN) (RCP) (4: 1) (C) DOLLARS and CENTS	EA	1.000	87
	467	6394		SET (TY II) (24 IN) (RCP) (6: 1) (C) DOLLARS and CENTS	EA	2.000	88
	467	6463		SET (TY II) (42 IN) (RCP) (4: 1) (C) DOLLARS and CENTS	EA	1.000	89
	467	6580		SET (REMOV & REINSTALL) DOLLARS and CENTS	EA	8.000	90
	474	6023		PRE-CAST TRNCH DRAIN(W/OUT CONC PVMNT) DOLLARS and CENTS	LF	375.000	91
	479	6003		ADJUSTING MANHOLES & INLETS DOLLARS and CENTS	EA	3.000	92
	479	6006		ADJUSTING INLET (CAP) DOLLARS and CENTS	EA	14.000	93
	480	6001		CLEAN EXIST CULVERTS DOLLARS and CENTS	EA	6.000	94
	496	6002		REMOV STR (INLET) DOLLARS and CENTS	EA	9.000	95
	496	6003		REMOV STR (MANHOLE) 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.				
	496	6016		REMOV STR (PIPE) DOLLARS and CENTS	EA	14.000	97
	496	6035		REMOV STR (DRILL SHAFT) DOLLARS and CENTS	EA	6.000	98
	500	6001		MOBILIZATION DOLLARS and CENTS	LS	1.000	99
	502	6001	008	BARRICADES, SIGNS AND TRAFFIC HANDLING DOLLARS and CENTS	MO	32.000	100
	506	6002	005	ROCK FILTER DAMS (INSTALL) (TY 2) DOLLARS and CENTS	LF	248.000	101
	506	6011	005	ROCK FILTER DAMS (REMOVE) DOLLARS and CENTS	LF	248.000	102
	506	6020	005	CONSTRUCTION EXITS (INSTALL) (TY 1) DOLLARS and CENTS	SY	3,704.000	103
	506	6024	005	CONSTRUCTION EXITS (REMOVE) DOLLARS and CENTS	SY	3,704.000	104
	506	6038	005	TEMP SEDMT CONT FENCE (INSTALL) DOLLARS and CENTS	LF	15,066.000	105
	506	6039	005	TEMP SEDMT CONT FENCE (REMOVE) DOLLARS and CENTS	LF	15,066.000	106
	506	6041	005	BIODEG EROSN CONT LOGS (INSTL) (12") DOLLARS and CENTS	LF	2,514.000	107
	506	6043	005	BIODEG EROSN CONT LOGS (REMOVE) DOLLARS and CENTS	LF	2,514.000	108

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	512	6013		PORT CTB (DES SOURCE)(SGL SLP)(TY 1) DOLLARS and CENTS	LF	55,530.000	109
	512	6025		PORT CTB (MOVE)(SGL SLP)(TY 1) DOLLARS and CENTS	LF	11,490.000	110
	512	6037		PORT CTB (STKPL)(SGL SLP)(TY 1) DOLLARS and CENTS	LF	55,530.000	111
	512	6080		PORT CTB CONNECT HARDWARE DOLLARS and CENTS	EA	2,244.000	112
	514	6001		PERM CTB (SGL SLOPE) (TY 1) (42) DOLLARS and CENTS	LF	13,683.800	113
	514	6036		PERM CTB (TRAN SSCB TO SSTR) (MOD) DOLLARS and CENTS	LF	360.000	114
	514	6040		PERM CTB (SSCB)(TY 3)(MOD) DOLLARS and CENTS	LF	250.000	115
	514	6044		PERM CTB (SGL SLOPE) (TY 1) SPECIAL DOLLARS and CENTS	LF	12,381.000	116
	540	6001	001	MTL W-BEAM GD FEN (TIM POST) DOLLARS and CENTS	LF	475.000	117
	540	6006	001	MTL BEAM GD FEN TRANS (THRIE-BEAM) DOLLARS and CENTS	EA	3.000	118
	540	6016	001	DOWNSTREAM ANCHOR TERMINAL SEC-TION DOLLARS and CENTS	EA	2.000	119
	542	6001		REMOVE METAL BEAM GUARD FENCE DOLLARS and CENTS	LF	5,714.000	120

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	542	6003		REMOVE DOWNSTREAM ANCHOR TERMINAL DOLLARS and CENTS	EA	7.000	121
	542	6004		RM MTL BM GD FENCE TRANS (THRIE-BEAM) DOLLARS and CENTS	EA	21.000	122
	543	6019		CABLE BARRIER TERMINAL SECTION (TL-3) DOLLARS and CENTS	EA	1.000	123
	543	6021		REMOVE CABLE BARRIER DOLLARS and CENTS	LF	24,324.000	124
	543	6022		REMOVE CABLE BARRIER TERMINAL SECTION DOLLARS and CENTS	EA	21.000	125
	544	6001		GUARDRAIL END TREATMENT (INSTALL) DOLLARS and CENTS	EA	5.000	126
	544	6003		GUARDRAIL END TREATMENT (REMOVE) DOLLARS and CENTS	EA	22.000	127
	545	6003		CRASH CUSH ATTEN (MOVE & RESET) DOLLARS and CENTS	EA	6.000	128
	545	6005		CRASH CUSH ATTEN (REMOVE) DOLLARS and CENTS	EA	22.000	129
	545	6007		CRASH CUSH ATTEN (INSTL)(L)(N)(TL3) DOLLARS and CENTS	EA	21.000	130
	545	6019		CRASH CUSH ATTEN (INSTL)(S)(N)(TL3) DOLLARS and CENTS	EA	1.000	131

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	610	6105		IN RD IL (U/P) (TY 1) (250W EQ) LED DOLLARS and CENTS	EA	24.000	132
	610	6162		IN RD IL (TY SA) 30T-8 (250W EQ) LED DOLLARS and CENTS	EA	11.000	133
	610	6286		IN RD IL (TY SA) 50T-8 (400W EQ) LED DOLLARS and CENTS	EA	5.000	134
	613	6002	001	HI MST IL POLE (100 FT)(100 MPH) DOLLARS and CENTS	EA	41.000	135
	618	6044		CONDT (PVC) (SCH 80) (1 1/2") DOLLARS and CENTS	LF	928.000	136
	618	6045		CONDT (PVC) (SCH 80) (1 1/2") (BORE) DOLLARS and CENTS	LF	1,220.000	137
	618	6046		CONDT (PVC) (SCH 80) (2") DOLLARS and CENTS	LF	26,049.000	138
	618	6047		CONDT (PVC) (SCH 80) (2") (BORE) DOLLARS and CENTS	LF	2,039.000	139
	618	6053		CONDT (PVC) (SCH 80) (3") DOLLARS and CENTS	LF	42.000	140
	618	6062		CONDT (RM) (3/4") DOLLARS and CENTS	LF	920.000	141
	618	6070		CONDT (RM) (2") DOLLARS and CENTS	LF	140.000	142
	620	6003		ELEC CONDR (NO.12) BARE DOLLARS and CENTS	LF	920.000	143

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	620	6004		ELEC CONDR (NO.12) INSULATED DOLLARS and CENTS	LF	1,840.000	144
	620	6007		ELEC CONDR (NO.8) BARE DOLLARS and CENTS	LF	21,188.000	145
	620	6008		ELEC CONDR (NO.8) INSULATED DOLLARS and CENTS	LF	42,376.000	146
	620	6009		ELEC CONDR (NO.6) BARE DOLLARS and CENTS	LF	7,281.000	147
	620	6010		ELEC CONDR (NO.6) INSULATED DOLLARS and CENTS	LF	14,562.000	148
	624	6002		GROUND BOX TY A (122311)W/APRON DOLLARS and CENTS	EA	6.000	149
	624	6010		GROUND BOX TY D (162922)W/APRON DOLLARS and CENTS	EA	100.000	150
	628	6052		ELC SRV TY A 240/480 060(SS)SS(E)GC(U) DOLLARS and CENTS	EA	11.000	151
	636	6007	001	REPLACE EXISTING ALUMINUM SIGNS(TY A) DOLLARS and CENTS	SF	377.000	152
	636	6009	001	REPLACE EXISTING ALUMINUM SIGNS(TY O) DOLLARS and CENTS	SF	227.500	153
	644	6004		IN SM RD SN SUP&AM TY10BWG(1)SA(T) DOLLARS and CENTS	EA	3.000	154
	644	6030		IN SM RD SN SUP&AM TYS80(1)SA(T) DOLLARS and CENTS	EA	7.000	155

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	644	6042		IN SM RD SN SUP&AM TYS80(1)SB(T) DOLLARS and CENTS	EA	2.000	156
	644	6076		REMOVE SM RD SN SUP&AM DOLLARS and CENTS	EA	12.000	157
	650	6048	001	INS OH SN SUP(40 FT CANT)(SPAN ONLY) DOLLARS and CENTS	EA	6.000	158
	650	6081	001	INS OH SN SUP(70 FT BRDG)(SPAN ONLY) DOLLARS and CENTS	EA	1.000	159
	650	6204	001	REMOVE OVERHD SIGN SUP DOLLARS and CENTS	EA	5.000	160
	658	6013		INSTL DEL ASSM (D-SW)SZ (BRF)CTB DOLLARS and CENTS	EA	58.000	161
	658	6026		INSTL DEL ASSM (D-SY)SZ (BRF)CTB DOLLARS and CENTS	EA	28.000	162
	658	6027		INSTL DEL ASSM (D-SY)SZ (BRF)CTB (BI) DOLLARS and CENTS	EA	343.000	163
	658	6061		INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2 DOLLARS and CENTS	EA	24.000	164
	662	6060		WK ZN PAV MRK REMOV (W)4"(BRK) DOLLARS and CENTS	LF	18,380.000	165
	662	6063		WK ZN PAV MRK REMOV (W)4"(SLD) DOLLARS and CENTS	LF	79,292.000	166
	662	6071		WK ZN PAV MRK REMOV (W)8"(SLD) DOLLARS and CENTS	LF	7,436.000	167

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	662	6072		WK ZN PAV MRK REMOV (W)12"(LNDP) DOLLARS and CENTS	LF	2,649.000	168
	662	6073		WK ZN PAV MRK REMOV (W)12"(SLD) DOLLARS and CENTS	LF	1,516.000	169
	662	6080		WK ZN PAV MRK REMOV (W)(ARROW) DOLLARS and CENTS	EA	14.000	170
	662	6090		WK ZN PAV MRK REMOV (W)(WORD) DOLLARS and CENTS	EA	14.000	171
	662	6095		WK ZN PAV MRK REMOV (Y)4"(SLD) DOLLARS and CENTS	LF	75,305.000	172
	666	6289	007	REF PROF PAV MRK TY I(Y)6"(SLD)(090MIL) DOLLARS and CENTS	LF	58,853.000	173
	668	6077		PREFAB PAV MRK TY C (W) (ARROW) DOLLARS and CENTS	EA	10.000	174
	668	6085		PREFAB PAV MRK TY C (W) (WORD) DOLLARS and CENTS	EA	8.000	175
	672	6010	001	REFL PAV MRKR TY II-C-R DOLLARS and CENTS	EA	2,393.000	176
	677	6001		ELIM EXT PAV MRK & MRKS (4") DOLLARS and CENTS	LF	173,467.000	177
	677	6002		ELIM EXT PAV MRK & MRKS (6") DOLLARS and CENTS	LF	120,537.000	178
	677	6003		ELIM EXT PAV MRK & MRKS (8") DOLLARS and CENTS	LF	15,750.000	179

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	677	6005		ELIM EXT PAV MRK & MRKS (12") DOLLARS and CENTS	LF	23,285.000	180
	677	6008		ELIM EXT PAV MRK & MRKS (ARROW) DOLLARS and CENTS	EA	28.000	181
	677	6012		ELIM EXT PAV MRK & MRKS (WORD) DOLLARS and CENTS	EA	28.000	182
	678	6002		PAV SURF PREP FOR MRK (6") DOLLARS and CENTS	LF	119,926.000	183
	678	6004		PAV SURF PREP FOR MRK (8") DOLLARS and CENTS	LF	8,704.000	184
	678	6005		PAV SURF PREP FOR MRK (10") DOLLARS and CENTS	LF	28,535.000	185
	678	6006		PAV SURF PREP FOR MRK (12") DOLLARS and CENTS	LF	6,900.000	186
	678	6009		PAV SURF PREP FOR MRK (ARROW) DOLLARS and CENTS	EA	10.000	187
	678	6016		PAV SURF PREP FOR MRK (WORD) DOLLARS and CENTS	EA	8.000	188
	730	6107		FULL - WIDTH MOWING DOLLARS and CENTS	CYC	11.000	189
	734	6002		LITTER REMOVAL DOLLARS and CENTS	CYC	11.000	190
	738	6003		CLEANING / SWEEPING (OUTSIDE MAIN LANE) DOLLARS and CENTS	CYC	32.000	191

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	3021	6001		WIDE FLANGE PAVEMENT TERMINALS DOLLARS and CENTS	LF	601.000	192
	5062	6001		PATCHING MILLED CONCRETE RUMBLE STRIPS DOLLARS and CENTS	LF	6,384.000	193
	6001	6001		PORTABLE CHANGEABLE MESSAGE SIGN DOLLARS and CENTS	DAY	112.000	194
	6019	6007		PREFB PV MK W/WNTY TY B(W)6"(BRK)CNTST DOLLARS and CENTS	LF	28,535.000	195
	6027	6003		CONDUIT (PREPARE) DOLLARS and CENTS	LF	531.000	196
	6027	6008		GROUND BOX (PREPARE) DOLLARS and CENTS	EA	10.000	197
	6038	6004		MULTIPOLYMER PAV MRK (W)(6")(SLD) DOLLARS and CENTS	LF	60,559.000	198
	6038	6006		MULTIPOLYMER PAV MRK (W)(6")(DOT) DOLLARS and CENTS	LF	514.000	199
	6038	6007		MULTIPOLYMER PAV MRK (W)(8")(SLD) DOLLARS and CENTS	LF	8,704.000	200
	6038	6011		MULTIPOLYMER PAV MRK (W)(12")(SLD) DOLLARS and CENTS	LF	4,607.000	201
	6038	6012		MULTIPOLYMER PAV MRK (W)(12")(LNDP) DOLLARS and CENTS	LF	2,293.000	202
	6156	6002		LED HI MST IL ASM (6 FIXT)(ASYM)(TY A) DOLLARS and CENTS	EA	41.000	203

ALT	ITEM-CODE			UNIT BID PRICE ONLY. WRITTEN IN WORDS	UNIT	APPROX QUANTITIES	DEPT USE ONLY
	ITEM NO	DESC CODE	S.P. NO.				
	6185	6005	002	TMA (MOBILE OPERATION) DOLLARS and CENTS	DAY	120.000	204

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

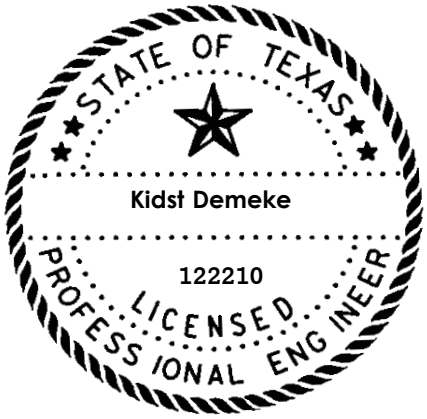
Control **3510-06-027**

Project **C 3510-6-27**

Highway **SH 99**

County **HARRIS**

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

Kidst Demeke, P.E.

NOVEMBER 16, 2023

General Notes:

General:

Area Engineer contact information for this project follows:

Phillip Garlin, P.E., Area Engineer; (281) 319-6451; Phillip.Garlin@txdot.gov
Roger Lopez, P.E., Assistant Area Engineer; (281) 319-6400; Roger.Lopez@txdot.gov

Submit any questions about this project via the Letting Pre-Bid Q&A web page, located at:

https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

The Letting Pre-Bid Q&A web page for each project can be accessed by scrolling or filtering the dashboard using the controls on the left side to navigate to the project. Hover over the blue hyperlink of the project to view the Q&A and click on the link in the window that pops up.

Large files with relevant project documentation, such as Geotech reports, As-Built plans, and cross-sections will continue to be provided on the following FTP site:

Index of /pub/txdot-info/Pre-Letting Responses/Houston District (state.tx.us) or

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/Houston%20District/

Unless otherwise shown on the plans, RAP generated by this project will become the property of the Contractor for use in the current construction project or in future projects.

If fixed features require, the governing slopes shown may vary between the limits shown and to the extent determined by the Engineer.

Superelevate the curves to match the existing surface.

Notify the Engineer immediately if discrepancies are discovered in the horizontal control or the benchmark data.

The following standard detail sheets are modified:

Modified Standards

FPM(3)-22(MOD)
IGSK (MOD)

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved, except for roadway illumination, electrical, and traffic signal items.

The cost for materials, labor, and incidentals to provide for traffic across the roadway and for ingress and egress to private property in accordance with Section 7.2.4 of the standard specifications is subsidiary to the various bid items. Restore access roadways to their original condition upon completing construction.

Grade street intersections and median openings for surface drainage.

If a foundation is to be placed where a riprap surface or an asphalt concrete surface presently exists, use caution in breaking out the existing surface for placement. Break out no greater area than is required to place the foundation. After placing the foundation, wrap the periphery with 0.5 in. pre-molded mastic expansion joint. Then replace the remaining portion of the broken out surface with Class A or Class C concrete or cold mix asphalt concrete to the exact slope, pattern, and thickness of the existing riprap or asphalt. Payment for breaking out the existing surface, wrapping the foundation, and replacing the surface is subsidiary to the various bid items.

The lengths of the posts for ground mounted signs and the tower legs for the overhead sign supports are approximate. Verify the lengths before ordering these materials to meet the existing field conditions and to conform to the minimum sign mounting heights shown in the plans.

Furnish aluminum Type A signs instead of plywood signs for signs shown on the Summary of Small Signs sheet.

Stencil the National Bridge Inventory (NBI) number on each existing bridge shown on these plans. The NBI number is shown above the title block for each bridge layout.

Clearly mark or highlight on the shop drawings, the items being furnished for this project. Submit required shop drawings in accordance with the shop drawing distribution list shown in the note for Item 5 for review and distribution.

Make requests for additional soil information for this project at the Area Engineer's office.

Any groundwater elevation information provided is representative of conditions existing on the day when and for the specific location where this information was collected. The actual groundwater elevation may fluctuate with time, climatic conditions, and construction activity.

Tolls incurred by the Contractor are subsidiary to the various bid items.

Procure permits and licenses, which are to be issued by the City, County, or Municipal Utility District.

The existing bridges located at at the locations listed on the table below has been tested for Asbestos Containing Materials (ACM) and found to contain 1% or less ACM. No mitigation was required.

1. SH 99 WB @ HCFCD M122-01-00	NBI No.	121020351006160
2. SH 99 EB @ Hufsmith- Khorville Rd.	NBI No.	121020351006207
3. SH 99 EB @ Gleannloch Forest Dr.	NBI No.	121020351006205
4. SH 99 WB @ Gleannloch Forest Dr.	NBI No.	121020351006206
5. SH 99 EB @ Champion Forest Dr.	NBI No.	121020351006247
6. SH 99 WB @ Champion Forest Dr.	NBI No.	121020351006248
7. SH 99 EB @ Glen Willow Dr./Max Conrad Dr.	NBI No.	121020351006179
8. SH 99 WB @ Glen Willow Dr./Max Conrad Dr.	NBI No.	121020351006180
9. SH 99 EB @ Spring Stuebener Rd./Boudreaux Rd.	NBI No.	121020351006222
10. SH 99 WB @ Spring Stuebener Rd. /Boudreaux Rd.	NBI No.	121020351006226
11. SH 99 EB @ East Spring Stuebener Rd.	NBI No.	121020351006227
12. SH 99 WB @ East Spring Stuebener Rd.	NBI No.	121020351006240
13. SH 99 EB @ Kuykendahl Rd.	NBI No.	121020351006228
14. SH 99 WB @ Kuykendahl Rd.	NBI No.	121020351006229
15. SH 99 EB @ Hildebrandt Rd.	NBI No.	121020351006208
16. SH 99 WB @ Hildebrandt Rd.	NBI No.	121020351006209

General: Roadway Illumination and Electrical

For roadway illumination and electrical items, use materials from pre-qualified producers as shown on the Construction Division (CST) of the Department's material producers list. Check the latest link on the Department's website for this list. The category/item is "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials found on this list.

Perform electrical work in conformance with the National Electrical Code (NEC) and the Department's standard sheets.

The Contractor may make the electrical grounding connections and permissible splices using the thermal fusion process, Cadweld, ThermOweld, or approved equal, instead of bolted connections and splices.

The Area Engineer will arrange with the Contractor, an inspection of the completed electrical systems for the highway lighting systems before final acceptance for compliance with plans and specifications. The inspection will be made with personnel from the electrical section of the Department's District Transportation Operations Office. The city's electrical division personnel will also inspect lighting systems within the city limits. Portions of the work found to be deficient during this inspection will not be accepted.

General: Site Management

Mark stations every 100 ft. and maintain the markings for the project duration. Remove the station markings at the completion of the project. This work is subsidiary to the various bid items.

Do not mix or store materials, or store or repair equipment, on top of concrete pavement or bridge decks unless authorized by the Engineer. Permission will be granted to store materials on surfaces if no damage or discoloration will result.

Personal vehicles of employees are not permitted to park within the right of way, including sections closed to public traffic. Employees may park on the right of way at the Contractor's office, equipment, and materials storage yard sites.

Assume ownership of debris and dispose of at an approved location. Do not dispose of debris on private property unless approved in writing by the District Engineer.

Control the dust caused by construction operations. For sweeping the base material in preparation for laying asphalt and for sweeping the finished concrete pavement, use one of the following types of sweepers or approved equal:

Tricycle Type	**Truck Type - 4 Wheel**
Wayne Series 900	M-B Cruiser II
Elgin White Wing	Wayne Model 945
Elgin Pelican	Mobile TE-3
	Mobile TE-4
	Murphy 4042

General: Traffic Control and Construction

Schedule construction operations such that preparing individual items of work follows in close sequence to constructing storm drains in order to provide as little inconvenience as practical to the businesses and residents along the project.

Schedule work so that the base placement operations follow the subgrade work as closely as practical to reduce the hazard to the traveling public and to prevent undue delay caused by wet weather.

This project requires extensive grading operations in an environmentally sensitive area.

If fences cross construction easements shown on the plans and work is required beyond the fences, remove and replace the fences as directed. This work and the materials are subsidiary to the various bid items.

When design details are not shown on the plans, provide signs and arrows conforming to the latest "Standard Highway Sign Designs for Texas" manual.

General: Utilities

Consider the locations of underground utilities depicted in the plans as approximate and employ responsible care to avoid damaging utility facilities. Depending upon scope and magnitude of planned construction activities, advanced field confirmation by the utility owner or operator may be prudent. Where possible, protect and preserve permanent signs, markers, and designations of underground facilities.

If the Contractor damages or causes damage (breaks, leaks, nicks, dents, gouges, etc.) to the utility, contact the utility facility owner or operator immediately.

Be aware that an operational Computerized Transportation Management System (CTMS) exists within the limits of this project and that the system must remain operational throughout construction. If the Contractor damages or causes damage to this system, repair such damage within 8 hours of occurrence at no cost to the Department. In the event of system damage, notify the Director of Traffic Management Systems at 713-881-3283 within one hour of occurrence. Failure of the Contractor to repair damage to the main fiber optic cable and CCTV cable trunk lines, which convey all corridor information to TranStar, will result in the Contractor being billed for the full cost of emergency repairs.

At least 72 hours before starting work, make arrangements for locating existing Department-owned above ground and underground fiber optic, communications, power, illumination, and traffic signal cabling and conduit. Do this by calling the Department's Houston District Traffic Signal Operations Office at 713-802-5662, or by e-mailing the Department's Houston District Traffic Signal Operations Office at: HOU-LocateRequest@txdot.gov, to schedule marking of underground lines on the ground. Use caution if working in these areas to avoid damaging or interfering with existing facilities.

Notify the Engineer at least 48 hours before constructing junction boxes at storm drain and utility intersections.

Install or remove poles and luminaires located near overhead or underground electrical lines using established industry and utility safety practices. Consult the appropriate utility company before beginning such work.

If overhead or underground power lines need to be de-energized, contact the electrical service provider to perform this work. Costs associated with de-energizing the power lines or other protective measures required are at no expense to the Department.

If working near power lines, comply with the appropriate sections of Texas State Law and Federal Regulations relating to the type of work involved.

Perform electrical work in conformance with the National Electrical Code (NEC) and Department's standard sheets.

Before beginning any underground work, notify the local entity's Chief Inspector, Public Works and Engineering, to establish the locations of any existing electrical systems for lighting facilities within the limits of this project.

General: Toll Items

Be aware that an operational tolling system exists within the limits of this project and that the system must remain operational throughout construction, except as may be approved in writing by the Department for integration of toll facilities constructed on this project. If the Contractor damages or causes damage to the tolling system, repair such damage within 8 hours of occurrence at no cost to the Department. In the event of toll system damage, notify the Director of Traffic Management Systems at 713/881-3283 and Project Finance Division Planning and Engineering Section Director at 512/874-9708 within one hour of occurrence. Failure of the Contractor to repair damage to the tolling fiber optic cable and conduit trunk lines will result in the Contractor being billed for the full cost of emergency repairs and revenue losses associated with the toll system down time.

Take extra precautions to ensure the construction equipment maneuvering in the toll zone areas does not strike gantry trusses/structures and overhead toll equipment, any damage to toll zone equipment or structures by the Contractor will be repaired at no cost to the Department.

<u>Contractor and Toll Systems Integrator Coordination and Notifications:</u>

Coordinate with the Engineer and the Department's Toll Systems Integrator immediately upon Contractor mobilization for installation of toll equipment in outside shoulder of toll zone prior to traffic switch for Phase 1.

Coordinate with the Engineer and the Department's Toll Systems Integrator before and during the installation, for toll specifications at each Toll Zone, of associated toll conduit and conduit stub-ups in the 100 ft. toll zone pavement.

Notify the Engineer in writing when the civil work within the toll zone is estimated to be 45 calendar days from completion. Such toll zone work includes (but is not limited to) the following:

- Barrier installed
- Pavement for toll zone locations constructed
- Lane striping within the toll zone limits complete
- Support infrastructure for toll operation constructed in accordance with Toll Systems Integrator's specifications
- Electrical conductor and tolling communication conduit installed
- Electrical conductor and tolling communication ground boxes installed
- Site construction complete including the completion of activities within the toll zone

Upon receipt of the 45-calendar day notification from the Contractor, the Engineer will notify the Toll Systems Integrator for scheduling of toll system equipment and loop sensor installation and subsequent toll system integration and testing by the Toll Systems Integrator.

Additionally, the contractor will notify the Engineer in writing at least 7 calendar days in advance of constructing the 100 ft. toll zone pavement for the Toll System Integrator to verify toll sensor stub-up locations, and rebar depth. Coordinate with the Toll Systems Integrator and notify the Engineer, in writing, upon completion of the toll zone work. No additional compensation will be allowed for this coordination.

Provide the Toll Systems Integrator with 90 working days of full and unobstructed usable access to the toll zone pavement and 500 ft from each end. The 90 working days will begin on date of the Department's written concurrence to the Contractor confirming completion of the toll zone civil work.

Full and unobstructed usable access to toll zone civil work includes (but is not limited to) the following:

- The toll zone sites are free of construction debris and ponding rainwater.
- Toll zone sites are free of construction vehicles that would inhibit the Toll System Integrator's test car routing or interrupt the Toll System Integrator's testing and integration activities in the toll zone.

<u>Traffic Control during Toll Systems Integrator work</u>

Coordinate with the Toll Systems Integrator to provide temporary traffic control (i.e., lane closures) as directed by the Engineer and as required to complete the toll systems installation, integration, and testing work described above. Temporary traffic control includes signs, barricades, and channelization required at each location and for durations that may include evenings, nights, and weekends (as needed) and may not occur on consecutive days. Do not

expect to have access to, nor conduct work within, the toll zone limits during the toll systems installation, integration, and testing phases, with the exception of providing services as described above. The Department may, at its own discretion, provide the Contractor access to the project to conduct work outside the services described above.

This work and coordination is incidental to Item 502.

Toll Equipment:

Furnishing and mounting overhead toll equipment is the responsibility of the Systems Integrator.

Toll Zone Pavement:

Provide conduit stub-ups in the toll zone pavement and in-pavement loop sensor conduit. The Toll Systems Integrator will cut and place pavement loop sensors within the 100 ft. toll zone pavement limits for each toll zone.

Fiber Optic Cable and Communication:

Fiber optic cable from the roadside toll equipment cabinet pads to the toll zones is the responsibility of the Toll Systems Integrator. Conduit is the responsibility of the Contractor.

Electrical Conductor and Service:

Electrical conductor from the roadside toll equipment cabinet pads to the toll zones is the responsibility of the Toll Systems Integrator. Conduit is the responsibility of the Contractor.

Item 5: Control of Work

Before contract letting, cross-section data for this project will be available to the prospective bidders in PDF format on the Department's Houston District website located at:

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/Houston%20District/Construction%20Projects/

The cross-section data provided above is for non-construction purposes only and it is the responsibility of the prospective bidder to validate the data with the appropriate plans, specifications, and estimates for the projects.

Submit shop drawings electronically for the fabrication of items as documented in Table 1 or Table 2 below. Information and requirements for electronic submittals can be viewed in the "Guide to Electronic Shop Drawing Submittal" which can be accessed through the following web link, https://ftp.txdot.gov/pub/txdot-info/library/pubs/bus/bridge/e_submit_guide.pdf. References to 11 in. x 17 in. sheets in individual specifications for structural items imply electronic CAD sheets.

Table 1

2014 Construction Specification Required Shop/Working Drawing Submittals - TxDOT Generated Plans

Spec Item No.'s	Product	Submittal Required	Approval Required (Y/N)	Contractor/ Fabricator P.E. Seal Required	Reviewing Party	Shop or Working Drawing (Note 1)
7.16.1&.2	Construction Load Analyses	Y	Y	Y	B	WD
400	Excavation and Backfill for Structures (cofferdams)	Y	N	Y	A	WD
403	Temporary Special Shoring	Y	N	Y	C	WD
420	Formwork/Falsework	Y	N	Y	A	WD
423	Retaining Walls, (calcs req'd.)	Y	Y	Y	C	SD
425	Optional Design Calculations (Prstrs Bms)	Y	Y	Y	B	SD
425	Prestr Concr Sheet Piling	Y	Y	N	B	SD
425	Prestr Concr Beams	Y	Y	N	B	SD
425	Prestr Concr Bent	Y	Y	N	B	SD
426	Post Tension Details	Y	Y	N	B	SD
434	Elastomeric Bearing Pads (All)	Y	Y	N	B	SD
441	Bridge Protective Assembly	Y	Y	N	B	SD
441	Misc Steel (various steel assemblies)	Y	Y	N	B	SD
441	Steel Pedestals (bridge raising)	Y	Y	N	B	SD
441	Steel Bearings	Y	Y	N	B	SD
441	Steel Bent	Y	Y	N	B	SD
441	Steel Diaphragms	Y	Y	N	B	SD
441	Steel Finger Joint	Y	Y	N	B	SD
441	Steel Plate Girder	Y	Y	N	B	SD
441	Steel Tub-Girders	Y	Y	N	B	SD
441	Erection Plans, including Falsework	Y	N	Y	A	WD
449	Sign Structure Anchor Bolts	Y	Y	N	T	SD
450	Railing	Y	Y	N	A	SD
462	Concrete Box Culvert	Y	Y	N	C	SD
462	Concrete Box Culvert (Alternate Designs Only,calcs reqd.)	Y	Y	Y	B	SD
464	Reinforced Concrete Pipe (Jack and Bore only; ONLY when requested)	Y	Y	Y	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets	Y	Y	N	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets (Alternate Designs Only, calcs req'd.)	Y	Y	Y	B	SD
466	Pre-cast Headwalls and Wingwalls	Y	Y	N	A	SD
467	Pre-cast Safety End Treatments	Y	Y	N	A	SD
495	Raising Existing Structure (calcs reqd.)	Y	Y	Y	B	SD
610	Roadway Illumination Supports (Non-Standard only, calcs reqd.)	Y	Y	Y	BRG	SD
613	High Mast Illumination Poles (Non-standard only, calcs reqd.)	Y	Y	Y	BRG	SD
627	Treated Timber Poles	Y	Y	N	T	SD
644	Special Non-Standard Supports (Bridge Mounts, Barrier Mounts,	Y	Y	Y	T	SD

	Etc.)					
647	Large Roadside Sign Supports	Y	Y	Y	T	SD
650	Cantilever Sign Structure Supports - Alternate Design Calcs.	Y	Y	Y	T	SD
650	Sign Structures	Y	Y	N	T	SD
680	Installation of Highway Traffic Signals	Y	Y	N	T	SD
682	Vehicle and Pedestrian Signal Heads	Y	Y	N	T	SD
684	Traffic Signal Cables	Y	Y	N	T	SD
685	Roadside Flashing Beacon Assemblies	Y	Y	N	T	SD
686	Traffic Signal Pole Assemblies (Steel) (Non-Standard only)	Y	Y	Y	T	SD
687	Pedestal Pole Assemblies	Y	Y	N	T	SD
688	Detectors	Y	Y	N	A	SD
784	Repairing Steel Bridge Members	Y	Y	Y	B	WD
SS	Prestr Concr Crown Span	Y	Y	N	B	SD
SS	Sound Barrier Walls	Y	Y	Y	A	SD
SS	Camera Poles	Y	Y	Y	TMS	SD
SS	Pedestrian Bridge (Calcs req'd.)	Y	Y	Y	B	SD
SS	Screw-In Type Anchor Foundations	Y	Y	N	T	SD
SS	Fiber Optic/Communication Cable	Y	Y	N	TMS	SD
SS	Spread Spectrum Radios for Signals	Y	Y	N	T	SD
SS	VIVDS System for Signals	Y	Y	N	T	SD
SS	CTMS Equipment	Y	Y	N	TMS	SD

Notes:

1. Document flow for Working Drawings differs from Shop Drawings in that Working Drawings must be submitted to the Engineer rather than the Engineer of Record and they are for the information of the Engineer only; an approval stamp and distribution to all project offices is not required.

Key to Reviewing Party

A - Area Office

Area Office	**Email Address**
North Harris Area Office	HOU-NHAShpDrwgs@txdot.gov
Traffic Systems Construction Office	HOU-TSCShpDrwgs@txdot.gov

B - Houston Bridge Engineer

Bridge Design (Houston TxDOT)	HOU-BrgShpDrwgs@txdot.gov

BRG - Austin Bridge Division

Bridge Design (Austin TxDOT)	BRG_ShopPlanReview@txdot.gov

C - Construction Office

Construction	HOU-ConstrShpDrwgs@txdot.gov
Laboratory	HOU-LabShpDrwgs@txdot.gov

T - Traffic Engineer

Traffic Operations	HOU-TrfShpDrwgs@txdot.gov

TMS – Traffic Management System

Computerized Traffic Management Systems (CTMS)	HOU-CTMSShpDrwgs@txdot.gov

Key to Reviewing Party

TMS – Traffic Management System

Computerized Traffic Management Systems (CTMS)	HOU-CTMSShpDrwgs@txdot.gov

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 7: Legal Relations and Responsibilities

The total area disturbed for this project is 36.00 acres. The disturbed area in this project, the project locations in the Contract, and Contractor project specific locations (PSLs) within 1 mile of the project limits for the Contract, will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer (to the appropriate MS4 operator when on an off-state system route) and to the local government that operates a separate storm drain system.

This project does not require a U.S. Army Corps of Engineers (USACE) Section 404 Permit before letting, but if a permit is needed during construction, assume responsibility for preparing the permit application. Submit the permit application to the Department's District Environmental Section for approval. Once the permit application is approved, the Department will submit it to the USACE. Assume responsibility for the requested revisions, in coordination with the Department's District Environmental Section.

Avoid encroaching into the wetland areas delineated in the plans. Place erosion control measures around the wetlands as shown on the plans. No construction work or construction equipment is permitted within this delineated area. If applicable for bridge construction, construct drilled shafts outside of this delineated area. Secure approval for the locations of field offices, material storage sites, material disposal sites, plants, borrow pits, etc. in writing before use to ensure that the proposed location is not within Jurisdictional Waters of the United States (wetlands).

Do not store any material in Waters of the United States inside the right of way without written approval.

Before construction operations begin, provide a drawing of the location of proposed temporary access roads, haul roads, or temporary fill used during construction operations to ensure that they are not within Jurisdictional Waters of the United States.

If the Contractor elects to use an area not permitted and determined to be within Jurisdictional Waters of the United States during the prosecution of the work, the Contractor will hold the Department harmless for delays caused by procuring the necessary permits from the United States Army Corps of Engineers.

Maintain the roadway slope stability. Maintaining slope stability is subsidiary to the various bid items.
If the work is on or in the vicinity of an at-grade railroad crossing, involves incidental work on railroad right of way, or involves construction of a railroad grade separation structure, notify the railroad company's Division Engineer and the Department's Project Engineer at least 30 days before performing any work on the railroad right of way and make arrangements for railroad flaggers unless otherwise shown in the contract. Obtain the required Railroad Right of Entry Permit from the railroad company. Payment of applicable permit fees is the responsibility of the Contractor. Acquiring the Railroad Right of Entry Permit is a lengthy process, allow sufficient time for this.

The nesting / breeding season for migratory birds is February 15 through September 30.

Conduct any tree removal outside of the migratory bird nesting season. If this is not possible due to scheduling, then exercise caution to remove only those trees with no active nests. Do not destroy nests on structures or in trees within the project limits during the nesting / breeding season.

Take measures to prevent the building of nests on any structures or trees within the project limits throughout the duration of the construction if work / removal will be performed during the nesting / breeding season. This can be accomplished by application of bird repellent gel, netting by hand every 3 to 4 days, or any other non-threatening method approved by the Houston District Environmental Section. Obtain this approval well in advance of the planned use. Contact the Houston District Environmental Section at 713-802-5244. The cost of this work is subsidiary to the various bid items.

No significant traffic generator events have been identified.

Item 8: Prosecution and Progress

The tabulation below shows the road-user cost for incentives/disincentives per day based on project milestones as determined by the traffic control phases. After the project is substantially complete, the liquidated damages become those based on contract administration costs.

Milestone	Begin	End	Working Day Allowed	Incentives/ Disincentives per Working Day	Maximum Days for Incentives	Maximum Amount for Incentives
Milestone 1	Day 1	Completion of Phase 2	939	$10,000	60	$600,000
Milestone 2	Phase 1-Step 1-3C	Completion of Phase 1 Step 1- 3C	12	$155,000	3	$465,000
Milestone 3	Phase 1-Step 2-1A	Completion of Phase 1 Step 2-1A	12	$160,000	3	$480,000

Contractor will be allowed 939 working days for the completion of this project.

The Contractor will receive a credit in the amount shown on above tabulation per day for completing the milestones in less than the number of allowable working days as stipulated on the tabulation above. The maximum amount of incentive is $ 1,545,000.00.

PROJECT MILESTONES:

Milestone 1:

Elimination or Reduction of Shoulders for WB and EB Mainlanes

Milestone 1 begins from day 1 of time charge upon commencement of works.

Milestone 1 will be complete when to the satisfaction of the Engineer, the Phase 2 Traffic Control Plan has been completed with the restoration of the Shoulders and Mainlanes traffics are open to traffic.

The total credit for early completion for Imbedded Milestone 1 for this project will not exceed $600,000.00.

Milestone 2:

Closure of Glennloch Forest Drive and Spring Stuebner Road at SH 99 (WEEKEND WORK ONLY)

Time charges for Milestone 2 begin within one working day of the commencement of Phase 1 Step 1 -3C.

Weekend work starts on Friday 9:00 PM and ends Monday at 5:00 AM. Closure table under Item 502 doesn't apply to this milestone closure.

Milestone 2 will be complete when to the satisfaction of the Engineer, the Phase 1 Step 1-3C Traffic Control Plan has been completed with Glennloch Forest Drive and Spring Stuebner Road are open to traffic.

The total credit for early completion for Imbedded Milestone 2 for this project will not exceed $465,000.00.

Milestone 3:

Closure of Hufsmith-Kohrville Road at SH 99 (WEEKEND WORK ONLY)

Time charges for Milestone 3 begin within one working day of the commencement of Phase 1 Step 2-1A.

Weekend work starts on Friday 9:00 PM and ends Monday at 5:00 AM. Closure table under Item 502 doesn't apply to this milestone closure.

Milestone 3 will be complete when to the satisfaction of the Engineer, the Phase 1 Step 2-1A Traffic Control Plan has been completed with Hufsmith-Kohrville Road is open to traffic.

The total credit for early completion for Imbedded Milestone 3 for this project will not exceed $480,000.00.

The tabulation above specifies the allowable duration for Project Milestones and the incentives/disincentives for early completion.

Create, maintain, and submit for approval, a Critical Path Method (CPM) project schedule using computer software that is fully compatible with the latest version of Primavera Systems, Inc. or Primavera Project Planner (P3 or P6).

The Department will supply bidders, upon written request, one electronic copy of the time determination schedule. The time determination schedule provided is for informational use only and is not intended for bidding or construction purposes.

The Department will not adjust the number of days for the project and milestones, if any, due to differences in opinion regarding any assumptions made in the preparation of the schedule or for errors, omissions, or discrepancies found in the time determination schedule.

Working days will be computed and charged based on a 7-day workweek in accordance with Section 8.3.1.3.

Provide a virus-free computer disk or other acceptable electronic media containing the Primavera construction schedule.

The Lane Closure Assessment Fee is $1,000 for the cross streets. This fee applies to the Contractor for closures or obstructions that overlap into restricted hour traffic for each hour or portion thereof, per lane, regardless of the length of lane closure or obstruction. For Restricted Hours subject to Lane Assessment Fee refer to the Item, "Barricades, Signs, and Traffic Handling." The time increment for the Lane Closure Assessment fee for this project is one hour.

Item 100: Preparing Right of Way

Obtain a local entity's plumbing permit and a demolishing permit or removing permit before demolishing or removing existing houses or commercial buildings.

Clean existing ditches under fill sections of undesirable materials including grass, muck, and trash. Perform this work in accordance with the Construction section of the Item, "Preparing Right of Way." This work is subsidiary to this bid Item.

The Item, "Preparing Right of Way" will be measured for payment only in those designated areas shown on the plans. Preparing right of way necessary to perform construction that is outside designated areas is subsidiary to this bid Item.

Remove abandoned utilities that are in conflict with the new utilities, at no expense to the Department.

Reestablish and maintain right of way stakes after completing the right of way preparation activities and until the new utilities are in place.

Remove and assume ownership of the existing ground mounted signs within the limits of roadway construction unless otherwise noted or directed. This work is subsidiary to the Item, "Preparing Right of Way."

Item 104: Removing Concrete

Removing concrete curb is paid as a separate bid item if the existing pavement on which it rests is not removed at the same time.

Item 105: Removing Treated and Untreated Base and Asphalt Pavement

Removing curb on cement-treated and untreated base or on cement treatment being removed at the same time is subsidiary to this bid Item.

Item 110: Excavation

If manipulating the excavated material requires moving the same material more than once to accomplish the desired results, the excavation is measured and paid for only once regardless of the manipulation required.

Transition the ditch grades and channel bottom widths at structure locations. Use only approved channel excavation in the embankment.

Item 132: Embankment

If salvaged base is used for the embankment material, break it into small pieces to achieve the required density and to facilitate placing in the embankment. Obtain approval of the material before placing in the embankment.

Furnish Type C material with a maximum Liquid Limit (LL) of 65, a minimum Plasticity Index (PI) of 5, and composed of suitable earth material such as loam, clay, or other materials that form a suitable embankment.

The embankment material used on the project which has a Liquid Limit exceeding 45 will be tested for Liquid Limits at the rate of one test per 20,000 cu. yd. or per total quantity less than 20,000 cu. yd., unless otherwise directed. Only use material that passes the above tests.

Furnish material with a maximum Liquid Limit (LL) of 65.

Item 162: Sodding for Erosion Control
Item 164: Seeding for Erosion Control
Item 166: Fertilizer
Item 168: Vegetative Watering

Refer to the "Fertilizer, Seed, Sod, Straw, Compost, and Water" plan sheet for material specifications, application rates, and for watering requirements.

Item 260: Lime Treatment (Road-Mixed)

For slurry placing, before discharging through the distributors, sufficiently agitate or mix the lime and water to place the lime in suspension and to obtain a uniform mixture.

The Engineer will observe the lime treatment that the Contractor elects to open to construction traffic immediately after compaction. If the construction traffic damages the subgrade, route the traffic off the damaged section in accordance with the standard specification. If the construction

traffic does not damage the subgrade, cure the subgrade until other courses of material cover it. Apply these courses within 14 days with a maximum curing period of 7 days.

Place the hydrated and the commercial lime as a water suspension or slurry according to the slurry placing method shown in Section 260.4.3.2, "Slurry Placement."

Use the type of lime at particular locations as directed.

Place the quicklime dry or as a slurry.

For the dry quicklime, a spreader box is not required if the lime material is evenly distributed.

In limited areas, the Contractor may construct the lime slurry subgrade under a sequence of work in which the application, mixing, and compaction are completed in the same working day, if approved by the Engineer.

Provide documentation from certified public scales showing gross, tare, and net weights. Provide producer's delivery tickets also showing gross, tare, and net weights. Completely empty the lime trailers at the project site. The Engineer may direct the Contractor to reweigh any shipment of lime on certified scales. The cost of this operation is subsidiary to the Item, "Lime Treatment (Road-Mixed)."

The percentage of lime shown on the plans is estimated on the basis of engineering tests. If soil tests made during construction indicate properties different than those originally anticipated, the Engineer may vary the percentage of the lime to provide soil characteristics similar to those of the preliminary tests.

Mix the lime with the new base material in an approved pug mill type stationary mixer.

Item 276: Cement Treatment (Plant-Mixed)

Before placing the new base, wet and coat the vertical construction joints between the new base and the previously placed base with dry cement.

If the total thickness of the cement treatment is greater than 8 in., compact it in multiple lifts in accordance with Section 276.4.3, "Compaction." Place the courses in the same working day unless otherwise approved.

Use Class N Cement Treatment containing 4.5 percent cement based on the dry weight of the aggregate. There is no minimum compressive strength requirement for this Item.

The requirement for core drilling to determine the thickness of cement treatment is waived if using less than 500 sq. yd. at one location.

For widening the existing pavement, the Engineer may waive the requirements for preparing the subgrade by scarifying and compacting if the as-cut subgrade can be maintained to the density of

the natural ground and to a uniform consistency when placing the base course. Keep the subgrade wet.

Compact in accordance with the standard specifications and complete the finishing operations within a period of 5 hours after adding the cement to the base material.

Cure the final course of cement treatment using an asphalt distributor that distributes the approved curing material and water mixture material at a rate of 0.25 gallons per square-yard evenly and smoothly or as recommended by the manufacturer at the recommended dilution rate, under a pressure necessary for proper distribution. Provide a curing material meeting the requirements of the Item, "Asphalts, Oils, and Emulsions" for curing the cement treatment. Use the following materials for curing the courses of cement treatment:

Curing Material	Application
Water	All courses, except final course
PCE	Final course

Continue curing until placing another course or opening the finished section to traffic.

Spread the material so that the layers of base are uniform in depth and in loose density before compacting.

Type E material consists of Type A material, crushed concrete (except under flexible pavement), or Reclaimed Asphalt Pavement (RAP) meeting the requirements of the Item, "Flexible Base." If approved, the 50 percent maximum RAP limitation may be waived.

Unless otherwise directed, place the next pavement layer within 7 working days of placing the base.

If using crushed stone for the Type E material under this Item, ensure it meets the requirements for the Item, "Flexible Base," Type A, Grade 1-2. Texas Test Method TEX-117-E is not required for this Item.

If using Recycled Type E cement treatment under proposed flexible pavement, produce it using the existing base salvaged from within this project or from other approved Department projects and salvaged asphalt concrete pavement. Do not use crushed concrete under flexible pavement.

If using Recycled Type E cement treatment under proposed concrete pavement, produce it using the existing base salvaged from within this project or from other approved Department projects, salvaged asphalt concrete pavement, or crushed concrete. If using crushed concrete as an aggregate, meet the requirements of Grade 3.

If using salvaged existing base and asphalt concrete pavement as described above, size it so that all the material, except the existing individual aggregate, passes the 2-in. sieve and is of a gradation that allows satisfactory compaction. Provide salvaged material that does not contain

deleterious material such as clay or organic material. Provide material passing the No. 40 sieve, defined as soil binder, with a maximum Plasticity Index of 10 and a maximum Liquid Limit of 35 when tested in accordance with test method TEX-106-E.

Meet the following additional requirements if the base and ACP are salvaged from other Department projects:

1. Obtain written approval before using the material.
2. Salvage and stockpile by approved methods.
3. Stockpile the material for exclusive use by the Department.

Item 292: Asphalt Treatment (Plant-Mixed)

If using the iron ore topsoil as the primary aggregate, meaning 80 percent or more by weight of the total mixture, the requirements for the water susceptibility test are waived.

Mixtures containing the iron ore topsoil are exempted from test methods TEX-217-F (Part I, separation of deleterious material and Part II, decantation test for coarse aggregate) and TEX-203-F (Sand Equivalent Test).

Assume responsibility for proportioning the materials entering the asphalt mixture, regardless of the type of plant used.

Furnish the mix designs for approval.

Compact the courses to a minimum density of 95 percent of the maximum density as determined using test method TEX-126-E.

Meet the following grading requirements:

Sieve Size	Percent Passing Grade 4 (Bondbreaker)
1-3/4 in.	-
1 in.	-
1/2 in.	100
No. 4	30 - 70
No. 40	15 - 45

Physical requirements are as follows:

Maximum Plasticity Index (PI) = 8
Maximum Liquid Limit (LL) = 35
Maximum Wet Ball Mill = 50 (crushed stone)
Maximum LA Abrasion = 50 (iron ore)

If blending the materials, perform the Wet Ball Mill test for the composite aggregate.

Form bituminous mix incorporating 3.5 to 7 percent asphaltic binder by dry weight.

For nominal aggregate size less than 0.5 in., design the mix in accordance with test method TEX-204-F.

If the layer thickness after placing is 1.25 in. or less, the bondbreaker is exempt from the in-place density control described in Section 292.4.5, "Compaction."

Item 360: Concrete Pavement

Where the pavement curb is left off for a later tie, provide the dowels or the tie bars as indicated on the paving detail sheets. The dowel bars and tie bars are subsidiary to the various bid items.

Repair portions of the concrete pavement surfaces that are damaged while in a plastic state before that area receives permanent pavement markings and opens to traffic. Perform repairs that are structurally equivalent to and cosmetically uniform with the adjacent undamaged areas. Do not repair by grouting onto the surface.

On pavement widening, hand finishing in place of the longitudinal float will be permitted.

Where existing pavement is widened with new pavement, place the new pavement a minimum of 2 ft. wide.

Equip the batching plants to proportion by weight, aggregates and bulk cement, using approved proportioning devices and approved automatic scales.

For mono curb, the curb height transitions will be paid at the contract unit price of the larger curb height in the transition. The 2.5-in. laydown curbs for driveways will be paid at the unit price bid for the Item, "Conc Curb (Mono) (Ty II)."

High-early strength cement may be used for frontage road and city street intersection construction.

Do not use limestone dust of fracture as fine aggregate.

If the concrete design requires greater than 5.5 sacks of cementitious material per cubic yard, obtain written approval. If placing concrete pavement mixes from April 1 to October 31, inclusive, use Mix Design Option 1 as specified in Section 421.4.2.6.1.

Perform saw cutting as shown on the plans in accordance with Section 360.4.10, "Sawing Joints." This saw cutting is subsidiary to this bid Item.

The pay limits for concrete pavements with traffic rails extends to the outside edge or back of the traffic rail.

Place steel fibers for the thin bonded concrete overlay at a rate of 75 lbs. per cubic yard. Add steel fibers to the concrete mix truck via conveyor at the batch plant. Submit procedures for placing the steel fibers as recommended by the manufacturer, as part of the mix design. If procedures are not satisfactory to the Engineer, stop concrete placement until a satisfactory solution is approved.

After the concrete has been batched, do not allow additional water into the mix. Use Type F high range water-reducing admixtures for slump control at the jobsite. Submit for approval a work plan for controlling the slump.

Construct the thin bonded concrete overlay in one continuous operation. Allow traffic on the surface only after the overlay has been placed and finished.

Before placing the concrete overlay, record the location of the construction joints.

Locate longitudinal joints for the thin bonded overlay to match the existing longitudinal joints within a plus or minus 1 in. range. Saw cut proposed longitudinal joints to 3/8 in. wide by 1-1/4in. deep and seal the joints using a Class 5 or Class 8 joint sealing compound. Within 5 minutes of sawing, completely remove the resulting slurry from the joint by flushing with high-pressure water. Dry the joint for a minimum of 48 hours before sandblasting the joint.

Supply on the job site polyethylene fabric sufficient to cover the section of concrete pavement scheduled for placement in one shift.

If curing operations do not follow the overlay operations closely as directed, due to lack of equipment or personnel, stop the paving operations until these are corrected.

The bonded concrete overlay surface does not require tine texturing. Perform tining on other concrete surfaces, including un-bonded concrete overlay surfaces.

Items 360, 420, and 421: All Concrete Items

For the Department's concrete cylinder split samples, transport the test cylinders to the Houston District Laboratory located at 7600 Washington Avenue in Houston, or to the appropriate Area Laboratory, when applicable. Transporting the test cylinders is subsidiary to the various bid items.

The approach pavement is paid for under the Item, "Concrete Pavement."

Item 400: Excavation and Backfill for Structures

Plugging existing pipe culverts is subsidiary to the various bid items.

If Recycled Cement Treatment (Type D) is included in the plans, the following additional requirements apply:

1. Use only approved sand, crushed concrete, or salvaged base free from deleterious matter, as aggregate for cement-stabilized backfill.
2. Provide crushed concrete or salvaged base backfill material in accordance with the Item, "Cement Treatment (Plant-Mixed) (Type D)" (base or crushed concrete), except the recycled Type D material must not contain Reclaimed Asphalt Pavement (RAP).
3. For backfill material below the spring line of pipes, use cement-stabilized sand rather than Recycled Type D backfill material.
4. For the cement-stabilized sand backfill, use a minimum of 7 percent of hydraulic cement based on the dry weight of backfill material. The cement content for the crushed concrete and salvaged base is specified in the Item, "Cement Treatment (Plant-Mixed) (Type D)."
5. Place and compact the stabilized backfill material using a gradation that provides a dense mass without segregating and is impervious to passing of water.

Item 416: Drilled Shaft Foundations

Include the cost for furnishing and installing anchor bolts mounted in the drilled shafts in the unit bid price for the various diameter drilled shafts.

The Department may test using ultrasonic methods the anchor bolts for overhead sign supports, light standards, and traffic signal poles after they are installed. Replace faulty anchor bolts as directed. Do not weld the anchor bolts.

Item 420: Concrete Substructures

Unless otherwise noted, use Class C concrete with an ordinary surface finish for signal, lighting, or sign structure foundations.

Mass concrete is a plans quantity item.

Item 421: Hydraulic Cement Concrete

Entrained air is required in all slip formed concrete (bridge rail, concrete traffic barrier, pavement, etc.), but is not required for other structural concrete. Adjust the dosage of air

entraining agent for low air content as directed or allowed by the Engineer. If entrained air is provided where not required, do not exceed the manufacturer's recommended dosage.

Item 432: Riprap

If stone riprap is shown on the plans, use common stone riprap in accordance with Section 432.2.3.3, placed dry in accordance with Section 432.3.2.3. Do not grout. Crushed concrete may also be used.

Item 442: Metal for Structures

Use temperature zone 1 for Charpy V-Notch (CVN) testing.

Prestressed concrete panels will not be allowed on steel structures.

Item 464: Reinforced Concrete Pipe

Concrete collars are subsidiary to the various bid items except for those specified on the plans for stage construction, which are paid for under the Item, "Concrete Substructures" as "Cl C Conc (Collar)."

Rubber gaskets are required for concrete pipe joints except for connections of safety end treatments, driveway culverts, and joints between the existing pipes and extensions.

Open, install, and backfill each section, or a portion of a section, in the same day at locations requiring pipe culverts under existing roadways.

Place the pipe drains across existing roadways half at a time to allow passage of traffic. No trenches may remain open overnight.

Known locations of existing stub-outs are shown on the plans, but these stub-outs may be in a different position or condition. Delays, inconveniences, or additional work required will not be a basis for additional compensation.

Provide leave-outs or holes in the proposed storm drain structures and pipes for drainage during interim construction. This work is subsidiary to the various bid items.

The flowline elevations of proposed ditches and structures are based on available survey data. Field-verify the elevations and locations of existing structures and adjust proposed ditches or structures as necessary to meet the field conditions. Before placing these structures, prepare and submit for approval, the data (revised elevation, alignment, length, etc.) for the adjusted structures.

If groundwater is encountered while installing the storm drain system, install a suitable dewatering system to facilitate construction of the storm drains. The costs for materials and

labor required to install and maintain this system are subsidiary to the Item, "Reinforced Concrete Pipe."

Item 465: Junction Boxes, Manholes, and Inlets

If required on the plans, build manholes and inlets to stage 1 construction, cover with temporary pavement, and complete in a later phase of construction. This temporary covering and pavement are subsidiary to the various bid items.

Construct manholes and inlets in graded areas, first to an elevation at least 4 in. above the top of the highest entering pipe and cover with a wooden cover. Complete the construction of such manholes and inlets to the finished elevation when completing the grading work for such manholes and inlets. Adjust the final elevation, if required, since this elevation is approximate.

Construct manholes and inlets in paved areas to an elevation so their temporary wooden covers are flush with the surface of the base material.

Do not leave excavations or trenches open overnight.

Items 496: Removing Structures

Assume ownership and remove from the project site, items salvaged from the existing bridge decks and steel beams.

Do not permit debris resulting from the structure removal or construction activities to enter a natural or manmade waterway such as drainage channels, rivers, streams, bays, etc. Remove debris which falls into such waterways. This work is subsidiary to the Item, "Removing Structures."

Item 502: Barricades, Signs, and Traffic Handling

Use a traffic control plan for handling traffic through the various phases of construction. Follow the phasing sequence unless otherwise agreed upon by the Area Engineer and the Project Manager. Ensure this plan conforms to the latest "Texas Manual on Uniform Traffic Control Devices" and the latest Barricade and Construction (BC) Standard Sheets. The latest versions of Work Zone Standard Sheets WZ (BTS-1) and WZ (BTS-2) are the traffic control plan for the signal installations.

Submit changes to the traffic control plan to the Area Engineer. Provide a layout showing the construction phasing, signs, striping, and signalizations for changes to the original traffic control plan.

Furnish and maintain the barricades and warning signs, including the necessary temporary and portable traffic control devices, during the various phases of construction. Place and construct these barricades and warning signs in accordance with the latest "Texas Manual on Uniform Traffic Control Devices" for typical construction layouts.

Cover work zone signs when work related to the signs is not in progress, or when any hazard related to the signs no longer exists.

Keep the delineation devices, signs, and pavement markings clean. This work is subsidiary to the Item, "Barricades, Signs, and Traffic Handling."

If a section is not complete before the end of the workday, pull back the base material to the existing pavement edge on a 6H: 1V slope. Edge drop-offs during the hours of darkness are not permitted.

Before detouring traffic onto the mainlane shoulders, remove dirt, debris, vegetation, and other deleterious material from the surface of the shoulders. Appropriately sign the detour in an approved manner. This work is subsidiary to the various bid items.

Cover or remove the permanent signs and construction signs that are incorrect or that do not apply to the current situation for a particular phase.

Replace the overhead signs, informational signs, and exit signs to be removed, with temporary signs providing the correct information to the traveling public. Size the replacement signs and include them in the traffic control plan.

Do not mount signs on drums or barricades, except those listed in the latest Barricades and Construction standard sheets.

Use traffic cones for daytime work only. Replace the cones with plastic drums during nighttime hours.

Place positive barriers to protect drop-off conditions greater than 2 ft. within the clear zone that remain overnight.

Do not reduce the existing number of lanes open to traffic except as shown on the following time schedule:

One Lane Closure

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Monday	09:00 AM – 04:00 PM	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 AM 04:00 PM – 09:00 PM
Tuesday	09:00 AM – 04:00 PM	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 AM 04:00 PM – 09:00 PM
Wednesday	09:00 AM – 04:00 PM	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 AM 04:00 PM – 09:00 PM
Thursday	09:00 AM – 04:00 PM	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 AM 04:00 PM – 09:00 PM
Friday	09:00 AM – 04:00 PM	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 AM 04:00 PM – 09:00 PM
Saturday	09:00 AM – 04:00 PM	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 AM 04:00 PM – 09:00 PM
Sunday	09:00 AM – 04:00 PM	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 AM 04:00 PM – 09:00 PM

Full Closure

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Monday	Not Permitted	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 PM
Tuesday	Not Permitted	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 PM
Wednesday	Not Permitted	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 PM
Thursday	Not Permitted	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 PM
Friday	Not Permitted	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 PM
Saturday*	Not Permitted	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 PM
Sunday*	Not Permitted	12:00 AM – 05:00 AM 09:00 PM – 11:59 PM	05:00 AM – 09:00 PM

*Does not apply to Milestones 2 and 3.

The above times are approved for the traffic control conditions listed. The Area Engineer may approve other closure times if traffic counts warrant. The Area Engineer may reduce the above times for special events.

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. Before payment will be made, complete the "Daily Report on Law Enforcement Force Account Work" (Form 318), provided by the Department and submit daily invoices that agree with this form for any day during the month in which approved services were provided.

Provide full-time, off-duty, uniformed, certified peace officers, as part of traffic control operations. The peace officers must be able to show proof of certification by the Texas Commission on Law Enforcement Officers Standards. The cost of the officers is paid for on a force account basis.

A minimum of 7 days in advance of any total closure, notify the Houston District Public Information Office of which roadways, ramps, intersections, or lanes will be closed, the dates they will remain closed, and when they will be opened again to traffic.
A minimum of 7 days in advance of any total closure, place a portable changeable message (PCM) sign at the location of each total closure which informs the traveling public of the details of the closure. Alternately, if the Traffic Control Plan provides a positive barrier at the location, a non-trailer mounted static message board sign behind the positive barrier may be used in place of a PCM.

Minimize the number of working days for street closures. The following table lists the maximum number of working days allowed for each street closure. The closure period for each intersection occurs only during the phase when constructing that street, unless otherwise directed. Reopen the street within the number of working days allowed; otherwise the Engineer may cease construction activities not affiliated with reopening the closed street, until it fully reopens to the traveling public. Time charges will not be suspended nor increased to compensate for this occurrence.

Street Name	Number of Working Days Allowed for Closure (Weekend only)
Hufsmith-Kohrville Rd	12
Boudreaux Rd/Gleannloch Forest Rd	6
Spring Stuebner-West Rd	6

During construction, remove, cover, adjust, or replace overhead sign panels to correspond with each current traffic control phase. The desirable size of letters for freeways is 10 in., the minimum is 8 in. This work is subsidiary to Item 502.

During the various phases of construction, maintain and relocate Logo signs/Specific Service signs located within the project limits. Maintenance and relocation of these signs are subsidiary to the Item, "Barricades, Signs, and Traffic Handling." These signs are Department-owned and administered by LoneStar Logos, a Department signage contractor.

Relocate a logo sign to avoid interference with construction phases as necessary. Assure that relocated signs meet clearance requirements. If clearance requirements cannot be met using the existing sign, contact the logo sign contractor to manufacture and deliver to the jobsite a smaller logo sign within 3 weeks. If there is absolutely no room to display the relocated logo sign, 2 weeks before relocating, contact the logo sign contractor to remove the sign and place it in storage. The telephone number for LoneStar Logos is (512) 462-1310 and the e-mail address for the regional manager, Tyler Starr, is tstarr@lonestarlogos.com.

When relocating a logo sign, provide wooden skid mounted sign supports for the sign that are crashworthy and in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices." Specific information on crash worthy skid mounted signs can be found at: http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/0-6782-2.pdf

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.

Contractor to refer to the General: Toll Items section for notes specific to traffic control during the toll systems installation, integration, and testing work.

Item 504: Field Office and Laboratory

Furnish one Type A structure for the laboratory. Ensure the windows for the structure have burglar bars.

Furnish a Type D structure for the asphalt mix control laboratory for the Engineer's exclusive use. In addition to the requirements of this Item, "Field Office and Laboratory," ensure this structure has a minimum height of 8 ft. Also ensure it has a minimum of 400 sq. ft. of gross floor area suitable for permanently located asphalt plants or 200 sq. ft. for temporarily located asphalt plants serving one project. Partition the floor area into a minimum of 2 interconnected rooms, and provide each room with an exterior door and a minimum of 2 windows. Construct the floor of sufficient strength to support the testing equipment and with an impervious covering.

Adequately air condition the Type D structure and furnish it with a minimum of one desk, 3 chairs, one file cabinet, a telephone, and one built-in equipment-storage cabinet suitable for storing nuclear equipment. Ensure the cabinet is a minimum of 3 ft. wide by 2 ft. deep by 3 ft. high and has a secure lock. Provide the structure with a 240-volt electrical service entrance. Use a licensed electrician to determine the service size and service entrance conductors. Provide a minimum service of four 120-volt circuits with 20 amp breakers, and a maximum of 2 grounded convenience outlets per circuit and a minimum of two 220-volt ovens with vents to the outside.

Provide a structure with a minimum of 2 convenience outlets per wall and a utility sink with an adequate, clean potable water supply for testing. Do not use space heaters to heat the structure. Use support blocks for the portable structures, tie them down, and securely attach them to the ground.

Determine the asphalt content by the ignition method and meet the requirements of Section 504.2.2.4.1, "Asphalt Content by Ignition Method" except provide a NEMA 6-50R (204/240 volt, 50 A) outlet within 2.25 ft. of the ignition oven location.

If an asphalt mix plant is located at the project site, provide a Type D structure with the dimensions of a Type C structure, at the project site to perform the asphalt mix quality control tests.

If a commercial source is used for the asphalt mix, provide a Type D structure with the dimensions of a Type C structure, at the commercial source site to perform the asphalt mix quality control tests.

Equip each lab with a first aid kit and at least a 20 lb. ABC type fire extinguisher. Also equip the labs with an eye wash station. Provide equipment that meets the minimum OSHA requirements.

Furnish one Type E structure for the field office. Ensure the windows for the structure have burglar bars.

Provide a Type E field office meeting the requirements of a Type C structure. Provide this as a single structure with a minimum of 500 sq. ft. of floor space and 3 rooms. Provide the structure with the following facilities. The cost of providing these items is subsidiary to this bid Item:

1. Three desks with 3 swivel chairs, two 5-drawer file cabinets and 3 straight back chairs.
2. Telephone service and equipment consisting of a minimum of one telephone with one extension. Include the call-waiting feature in the service.
3. Potable water with an electric water cooler, a cup dispenser, and cups.
4. Adequate heating, air conditioning, lighting, and a sufficient number of electrical outlets.
5. A commercially available toilet or equivalent facility for the field office and each laboratory.
6. A suitable printer/copier/fax machine for the field office as approved by the Engineer.

Provide a fenced enclosure approximately 100 ft. by 200 ft. Provide an appropriate parking area covered with a suitable base material and with a minimum of 2 security lights, one on each end of the lot. Cost of the work and materials to provide the enclosure are subsidiary to the various bid items.

The above requirements are subsidiary to the various bid items.

Assume ownership of temporary chain link security fences.

Equip each field office with a first aid kit and at least a 20 lb. ABC type fire extinguisher.

Item 506: Temporary Erosion, Sedimentation and Environmental Controls

A Storm Water Pollution Prevention Plan (SWP3) is required. Since the disturbed area is more than 5 acres, a "Notice of Intent" (NOI) is also required.

Use appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area. Remove and dispose of materials in compliance with State and Federal laws.

Before starting construction, review with the Engineer the SWP3 used for temporary erosion control as outlined on the plans. Before construction, place the temporary erosion and sedimentation control features as shown on the SWP3.

Schedule the seeding or sodding work as soon as possible. The project schedule provides for a vegetation management plan.

After completing earthwork operations, restore and reseed the disturbed areas in accordance with the Department's specifications for permanent or temporary erosion control.

Implement temporary and permanent erosion control measures to comply with the National Pollution Discharge Elimination System (NPDES) general permit under the Clean Water Act.

Before starting grading operations and during the project duration, place the temporary or permanent erosion control measures to prevent sediment from leaving the right of way.

Item 512: Portable Traffic Barrier

Transport Low Profile Concrete Barriers (LPCB) used for traffic handling from the Department's stockpile located on the north side of IH 610 at Long Drive.

Transport Standard Height Portable Traffic Barriers (including J-J Hook and Safety Shape) used for traffic handling from the Department's stockpile located on the south side of IH 610 at Cedar Crest Blvd. (located across IH 610 from Long Drive).

Use only the J-J Hook type connection between barriers.

After completing the project, return Standard Height Portable Traffic Barriers (including J-J Hook and Single Slope) used for traffic handling, to the Department's stockpile located on the south side of at IH 610 at Cedar Crest Blvd. (located across IH 610 from Long Drive). After

completing the project, return the associated Single Slope barrier connecting hardware to the area office or as directed.

If placing the portable traffic barrier on pre-stressed concrete box beams with exposed reinforcing steel, protect the reinforcing steel by supporting the portable traffic barrier on 4 in. by 4 in. timbers. Place the timbers transversely and space them on 4 ft. centers. The cost of the labor and materials to perform this work are subsidiary to the Item, "Portable Traffic Barrier."

Item 514: Permanent Concrete Traffic Barrier

Add a 3/4-in. longitudinal chamfer to the Single Slope Concrete Barrier (SSCB) railing. Provide a continuous chamfer typically located 6 in. above the final grade. The cost of this is subsidiary to the Item, "Permanent Concrete Traffic Barrier."

Item 540: Metal Beam Guard Fence

Painting the timber posts is not required.

Use timber posts for galvanized steel metal beam guard fence, except for anchorage at turned down ends.

Furnish and install wood blocks between the rail elements and the timber posts as detailed on the plans. These block-outs are subsidiary to this bid Item.

The quantity of the metal beam guard fence is subject to change.

Provide a mow strip as shown on the plans, at metal beam guard fence locations, including any guardrail end treatments.

Galvanize the rail elements supplied for this project by using a Type II Zinc Coating.

At locations requiring attachment of Metal Beam Guard Fence (MBGF) to concrete railing or concrete traffic barrier, repair and fill any existing holes in the railing or barrier that are not in the correct location for attaching the new MBGF. Perform this work in accordance with the Item, "Concrete Structure Repair." Existing anchor bolt holes that cannot be utilized must be filled with an epoxy grout before drilling new holes. Then core-drill new holes in the correct locations and repair any resulting spalls at no expense to the Department. This work is considered subsidiary to the MBGF transition section (Item 540).

Item 542: Removing Metal Beam Guard Fence

Remove and assume ownership of unsalvageable metal beam guard fence rail elements and posts.

Replace removed wood posts which are unusable because of damage by the Contractor, at no expense to the Department.

Item 545: Crash Cushion Attenuators

After completing the project, return remaining unused crash cushion attenuators units to the Area Office Maintenance yard or as directed, at no cost to the Department.
A MASH compliant crash cushion attenuator is required for every temporary and permanent installation.

Item 585: Ride Quality for Pavement Surfaces

To eliminate the need for corrective action due to excessive deviations in the final surface layers, exercise caution to ensure satisfactory profile results in the intermediate paving layers (mixture).

Milling will not be allowed as a corrective action for excessive deviations in the final surface layer of hot-mix asphalt.

For Continuously Reinforced Concrete Pavement (CRCP) mainlanes and direct connectors, use Surface Test Type B and Pay Adjustment Schedule 2. For ramps use Surface Test Type A.

For Jointed Reinforced Concrete Pavement (JRCP), use Surface Test Type A.

For all other roads (cross streets and intersections), use Surface Test Type A..

Item 610: Roadway Illumination Assemblies

The cost of providing the electrical conductor in the pole foundation or in the pole base to make connections is subsidiary to the roadway illumination assembly. The quantity for payment is the surface distance between locations.

Fabricate steel roadway illumination poles in accordance with the latest Department RIP (Roadway Illumination Poles) Standards. Poles manufactured according to the latest RIP Standards require no shop drawings. Alternate designs to the Department's RIP Standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically.

For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25 ft. above the surrounding terrain, provide shop drawings (see ftp://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/e_submit_guide.pdf) and calculations that are sealed, signed, and dated by a professional engineer registered or licensed in Texas.

Supply anchor bolt assemblies as shown on the RIP standard sheets, unless a larger capacity bolt assembly is required for the 3-second gust wind speed and mounting elevation at the pole installation location.

Item 613: High Mast Illumination Poles

Place the metal beam guard fence before placing the high mast foundation.

Before erecting the high mast poles, notify the Engineer a minimum of 3 working days in advance for scheduling the inspection of each assembled high mast pole and high mast assembly.

Place high mast illumination poles in locations so that the light mounting and support assembly can be lowered and maintained from ground level without interfering with bridges or retaining walls. Notify the Engineer of any such conflicts.

Provide anchor bolts for high mast illumination poles in accordance with the Item, "Anchor Bolts."

Item 614: High Mast Illumination Assemblies

Erect and place in operation high mast illumination poles before removing existing illumination facilities.

The high mast power cable must meet the latest edition of TxDOT Standard sheets, "High Mast Illumination Details" (HMID) and Department Material Specification (DMS) 11021, "High Mast Assembly Kits.
Provide Cord Connectors for Electrical Power Cable, which are UL-listed, watertight, 480 V, 30 Amp, 2P3W pin, and sleeve devices. Ensure the plug is IEC Type 330P7W and the connector is IEC Type 330C7W.

Provide pre-qualified High-Pressure Sodium (HPS) lamps from the Material Producer List (MPL) of the wattages shown on the plans, shipped and secured within the fixture. No alternatives are allowed. Provide HPS lamps that have an average rated lamp life of 30,000 hours. Ensure that the lamps fully extinguish at the end of the usable lamp life and remain extinguished without cycling. Do not provide lamps that burn at a reduced output at their end of life. Meet the Federal Toxic Characteristic Leachate Procedure (TCLP).

Item 616: Performance Testing of Lighting Systems

The illumination plans provide for a complete illumination system installed, connected, tested, and ready for operation.

After satisfactory completion of tests, place the new lighting fixtures in operation. Final acceptance will be made after the fixtures operate satisfactorily for a minimum period of 14 days. The 14-day test period is included in the allowed working days.

Assume responsibility for the new lighting fixtures during the test period. Make adjustments or repairs as required and repair defects or damage at no expense to the Department.

Item 618: Conduit
Item 620: Electrical Conductors
Item 628: Electrical Services

If the specifications for electrical items require UL-listed products, this means UL-listed or CSA-listed.

Item 618: Conduit

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

When backfilling bore pits, ensure that the conduit is not damaged during installation or due to settling backfill material. Compact select backfill in 3 equal lifts to the bottom of the conduit; or if using sand, place it 2 in. above the conduit. Ensure backfill density is equal to that of the existing soil. Prevent material from entering the conduit.

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.

Construct bore pits a minimum of 5 ft. from the edge of the base or pavement. Close the bore pit holes overnight.

Unless otherwise shown on the plans, install underground conduit a minimum of 24 in. deep. Install the conduit in accordance with the latest National Electrical Code (NEC) and applicable Department standard sheets. Place conduit under driveways or roadways a minimum of 24 in. below the pavement surface.

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

If using casing to place bored conduit, the casing is subsidiary to the conduit.

If placing the conduit under existing pavement to reach the service poles, bore the conduit in place and extend it a minimum distance of 5 ft. beyond the edge of shoulder or the back of curb.

Where PVC, duct cable, and HDPE conduit 1 in. and larger is allowed and installed per Department standards, provide a PVC elbow in place of the galvanized rigid metal elbow required by the Electrical Details standards. Ensure the PVC elbow is of the same schedule rating as the conduit to which it is connected. Use only a flat, high tensile strength polyester fiber pull tape to pull conductors through the PVC conduit system.

Remove conductor and conduit to be abandoned to 1 ft. below the ground level. This work is subsidiary to the various bid items.

Do not use cast iron junction boxes in concrete traffic barriers and single slope traffic barriers. Use polymer concrete junction boxes as shown on standard sheet ED (4)-14,CTBI (3), CTBI (4),

and SSCB (4). Mount the junction boxes flush (+ 0 in., - 1/2 in.) with the concrete surface of the concrete barrier.

Use materials from pre-qualified producers as shown on the Department's Construction Division (CST) material producers list. Check the latest links on the Department's website for the list. The category is "Roadway Illumination and Electrical Supplies." The polymer concrete barrier box is subsidiary to Item 618, "Conduit."

If the Contractor chooses to combine multiple conduits into one bore, the Contractor will install a casing around the conduits. The casing will not be paid for directly but will be considered subsidiary to this item.

Provide a single 1/C #14 insulated wire in conduit runs which have been identified in the plans to carry fiber optic cable. Provide UL-listed solid copper wire with orange color low density polyethylene insulation, suitable for conduit installation, rated for a temperature range of -20 C to +60 C and a voltage rating of 600V. This wire will serve as a tracer, or locate, wire for locating underground conduit containing fiber optic cabling and will be paid for under Item 620, "Electrical Conductors."

Item 620: Electrical Conductors

Test each wire of each cable or conductor after installation. Incomplete circuits or damage to the wire or the cable are cause for immediate rejection of the entire cable being tested. Remove and replace the entire cable at no expense to the Department. Also test the replacement cable after installation.

When pulling cables or conductors through the conduit, do not exceed the manufacturer's recommended pulling tensions. Lubricate the cables or conductors with a lubricant recommended by the cable manufacturer.

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holders as shown on the Department's Construction Division (CST) material producers list. Check the latest link on the Department's website for this list. The category is "Roadway Illumination and Electrical Supplies." The fuse holder is shown on the list under Items 610 and 620. Provide 10 Amp time delay fuses.

Ensure that circuits test clear of faults, grounds, and open circuits.

Split bolt connectors are allowed only for splices on the grounding conductors.

For electrical licensing and electrical certification requirements for this project, see Item 7 of the Standard Specifications and any applicable special provisions to Item 7.

Item 624: Ground Boxes

The ground box locations are approximate. Alternate ground box locations may be used as directed, to avoid placing in sidewalks or driveways.

Ground metal ground box covers. Bond the ground box cover and ground conductors to a ground rod located in the ground box and to the system ground.

Ground the existing metal ground box covers as shown on the latest standard sheet ED (4)-14.

During construction and until project completion, provide personnel and equipment necessary to remove ground box lids for inspection. Provide this assistance within 24 hours of notification.

Construct concrete aprons in accordance with the latest standard sheet ED (4)-14. Make the depth of the concrete apron the same as the depth of the ground box, except for Type 1 and Type 2 ground boxes. For Type 1 or Type 2 ground boxes, construct the concrete apron in accordance with details shown on the "Ground Box Details Installations" standard.

Item 628: Electrical Services

Verify and coordinate the electrical service location with the engineering section of the appropriate utility district or company.

Identify the electrical service pole with an address number assigned by the Utility Service Provider. Provide 2-in. numerals visible from the highway. Provide numbers cut out aluminum figures nailed to wood poles or painted figures on steel poles or service cabinets.

Item 636: Signs

For design details not shown on the plans, provide signs and arrows conforming to the latest "Standard Highway Sign Designs for Texas" manual.

Item 644: Small Roadside Sign Assemblies

Sign locations shown on the plans are approximate. Before placing them, obtain approval of and then stake the exact locations for these signs.

Use the Texas Universal Triangular Slip Base with the concrete foundation for small ground mounted signs, unless otherwise shown in the plans.

Remove existing street name signs from existing stop signs and re-install them above the new stop signs. Removing and re-installing existing street name signs is subsidiary to the Item, "Small Roadside Sign Assemblies."

When design details are not shown on the plans, provide signs and arrows conforming to the latest "Standard Highway Sign Designs for Texas" manual.

Provide and install the materials for speed limit signs. For speed limit signs that are indicated with "XX," the Area Engineer will request a speed study through the Director of Transportation Operations to determine the legal speeds to be posted. This request will be made as soon as possible after the roadway opens to traffic. After the speed limit to be posted is determined, this information will be provided to the Contractor by the Area Engineer.

Use Type E Super High Specific Intensity (Fluorescent Prismatic) yellow green reflective sheeting background to fabricate school signs (S1-1, S3-1, S4-3, S5-1, W16-2, SW16-9p, and SW16-7pL(R)).

Assume ownership of the removed existing signposts. Store removed sign panels at the Contractor's field office, to be picked up by the maintenance office. This work is subsidiary to this item.

Locations of the relocated signs are approximate. Before placing them, obtain approval of and then stake the exact locations for these signs.

Replace existing signs that become damaged during relocation at no expense to the Department.

Item 650: Overhead Sign Supports

Stencil the structure numbers on the new structures for permanent identification.

If sign panels mounted on an overhead sign support face the same direction of traffic, keep the bottoms of the sign panels in the same horizontal plane, unless otherwise shown in the plans.

There is no additional reimbursement for blocking or shims for fits of alignment.

Mill test reports are not required for the walkway, grating, miscellaneous secondary structural items, or hardware.

Use the existing panel supports if removing existing guide signs and if placing new panels of different sizes at the same location. Extend the supports, if needed. If the supports extend over the top of the panel, cut off the supports at the top of the panel or the top of the truss, whichever is higher.

Before fabricating, field check the sign structure elevations, details, and dimensions shown on the plans.

If sign lighting and walkways are not used, trim the sign support brackets flush with the bottoms of the signs.

Assume ownership of the removed existing signposts. Store removed sign panels at the Contractor's field office, to be picked up by the maintenance office. This work is subsidiary to this item.

Item 656: Foundations for Traffic Control Devices

Excavating and disposing of surplus materials for lighting standard foundations are subsidiary to the roadway illumination assembly foundation. Dispose of surplus excavated material. Use rigid metal conduit (RMC) for stub-outs in foundation and concrete structures. These stub-outs are subsidiary to the drilled shaft foundations.

Using ready mix concrete for sign foundations is optional.

Item 662: Work Zone Pavement Markings

At the end of each workday, mark roadways that remain open to traffic during construction operations with standard pavement markings, in accordance with the latest "Texas Manual on Uniform Traffic Control Devices."

Using raised markers for removable work zone pavement markings on final concrete surfaces is optional.

Do not use raised pavement markers as optional work zone pavement markings on final asphalt surfaces.

For transition lane lines and detour lane lines, use raised pavement markers as shown for solid lines on the latest Barricade and Construction standard sheet for "Work Zone Pavement Marking Details."

Item 662: Work Zone Pavement Markings
Item 666: Reflectorized Pavement Markings
Item 668: Prefabricated Pavement Markings
Item 6019: Longitudinal Prefabricated Pavement Markings (PPM) with Warranty
Item 6038: Multipolymer Pavement Markings (MPM)

Use Type III glass beads for thermoplastic and multipolymer pavement markings.

Use a 0.100 in. (100 mil) thickness for thermoplastic pavement markings, measured to the top of the thermoplastic, not including the exposed glass beads.

Use a 0.022 in. (22 mil) thickness for multipolymer pavement markings, measured to the top of the multipolymer, not including the exposed glass beads.

For roadways with asphalt surfaces to be striped with work zone or permanent thermoplastic markings, the Contractor has the option to apply paint and beads markings for a maximum 30-day period until placing the thermoplastic markings, or until starting the succeeding phase of

work on the striped area. Maintain the paint and beads markings, at no expense to the Department, until placing the thermoplastic markings or starting the succeeding phase of work on the striped area. The work zone markings, whether paint and beads or thermoplastic, are paid under the Item, "Work Zone Pavement Markings" and the markings are paid for only once for the given phase of construction.

If using paint and bead markings as described above, purchase the traffic paint from the open market.

If the Type II markings become dirty and require cleaning by washing, brushing, compressed air, or other approved methods before applying the Type I thermoplastic markings, this additional cleaning is subsidiary to the Item, "Reflectorized Pavement Markings."

Establish the alignment and layout for work zone striping and permanent striping.

Stripe all roadways before opening them to traffic.

Place pavement markings under these items in accordance with details shown on the plans, the latest "Texas Manual on Uniform Traffic Control Devices," or as directed.

When design details are not shown on the plans, provide pavement markings for arrows, words, and symbols conforming to the latest "Standard Highway Sign Designs for Texas" manual.

Item 672: Raised Pavement Markers

If other operations are complete on the project and if the curing time period is not yet elapsed, the contract time will be suspended until the curing is done.

Before placing the raised pavement markers on concrete pavement, blast clean the surface using an abrasive-blasting medium. This work is subsidiary to the Item, "Raised Pavement Markers."

Provide epoxy adhesive that is machine-mixed or nozzle-mixed and dispensed. Equip the machine or nozzle with a mechanism to ensure positive mix measurement control.

Item 677: Eliminating Existing Pavement Markings and Markers

Remove existing pavement markings on concrete or asphalt surfaces by flail milling or as directed.

Item 678: Pavement Surface Preparation for Markings

Do not blast clean asphalt concrete pavement. Clean asphalt concrete pavement as required under the applicable specifications or as directed.

On new concrete pavement or on existing concrete pavement when placing a new stripe on a new location, remove the curing compounds and contamination from the pavement surface by flail

milling or as directed. In addition, air-blast the surface with compressed air just before placing the new stripe.

On existing concrete pavement when placing a new stripe on an existing location, after removing the existing stripe under the Item, "Eliminating Existing Pavement Markings and Markers," air-blast the surface with compressed air just before placing the new stripe.

Do not clean concrete pavement by grinding.

Item 730: Roadside Mowing
Item 734: Litter Removal
Item 738: Cleaning and Sweeping

Mow areas of existing vegetation, collect and dispose of litter, and sweep the roadway within the project limits according to the following chart for the duration of the project or as directed. This work is paid for under their respective bid items.

Roadside Mowing	Litter Removal	Cleaning and Sweeping Highways
3 cycles/Year	3cycles/Year	1 cycle/Month

Item 6053: Shifting or Removing Existing Overhead Signs

Assume ownership of the removed existing signposts. Store removed sign panels at the Contractor's field office, to be picked up by the maintenance office. This work is subsidiary to this item.

Item 6185: Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

A shadow vehicle with Truck Mounted Attenuators (TMAs) or Trailer Attenuators (TAs) is required as shown on the appropriate Traffic Control Plan (TCP) sheets. TMAs/TAs must meet the requirements of the Compliant Work Zone Traffic Control Device List.

Level 3 Compliant TMAs/TAs are required for this project.

In addition to the shadow vehicles with TMAs/TAs that are specified as being required on the TCP layout sheets for this project, provide additional shadow vehicles with TMAs/TAs as shown on the TCP Standard sheets. The Contractor is responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed on the project.

Basis of Estimate

Item	Description	Limit and Rate	Unit
247	Flexible Base • Crushed Stone	 138 Lb. / Cu. Ft.	TON
260	Lime Treatment (Road-Mixed) For materials used as subgrade * • Lime(HYD, COM, or QK)(SLRY) or QK(DRY)	 6 % by weight based on 100 Lb. / Cu. Ft. subgrade	SY TON
275	Cement Treatment (Road-Mixed) For materials used as subgrade * • Cement	 6 % by weight based on 100 Lb. / Cu. Ft. subgrade	SY TON
292	Asphalt Treatment (Plant-Mixed) • Asphalt • Aggregate	110 Lb. / Sq. Yd.-In. 5 % by weight 95 % by weight	TON

* If used in existing roadway base, rate will be determined on a case-by-case basis.

CONTROL : 3510-06-027
PROJECT : C 3510-6-27
HIGHWAY : SH 99
COUNTY : HARRIS

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 NOVEMBER 1, 2014. STANDARD SPECIFICATIONS ARE INCORPORATED INTO THE CONTRACT BY REFERENCE.

ITEMS 1 TO 9 INCL., GENERAL REQUIREMENTS AND COVENANTS
ITEM 100 PREPARING RIGHT OF WAY (103)
ITEM 104 REMOVING CONCRETE
ITEM 105 REMOVING TREATED AND UNTREATED BASE AND ASPHALT PAVEMENT
ITEM 110 EXCAVATION (132)
ITEM 132 EMBANKMENT (100)(160)(204)(210)(216)(260)(400)
ITEM 161 COMPOST (160)
ITEM 162 SODDING FOR EROSION CONTROL (166)(168)
ITEM 164 SEEDING FOR EROSION CONTROL (162)(166)(168)
ITEM 166 FERTILIZER (520)
ITEM 168 VEGETATIVE WATERING
ITEM 247 FLEXIBLE BASE (105)(204)(210)(216)(520)
ITEM 260 LIME TREATMENT (ROAD-MIXED) (105)(132)(204)(210)(216) (247)(300)(310)(520)<3096>
ITEM 275 CEMENT TREATMENT (ROAD-MIXED) (132)(204)(210)(216)(247) (300)(310)(520)<3096>
ITEM 276 CEMENT TREATMENT (PLANT-MIXED) (204)(210)(216)(247)(300) (310)<520><3096>
ITEM 292 ASPHALT TREATMENT (PLANT-MIXED) (300)(301)(320)(520)(585) <3096>
ITEM 360 CONCRETE PAVEMENT (421)(422)(438)(440)(529)(585)
ITEM 400 EXCAVATION AND BACKFILL FOR STRUCTURES (110)(132)(401) (402)(403)(416)(420)(421)(423)
ITEM 402 TRENCH EXCAVATION PROTECTION
ITEM 403 TEMPORARY SPECIAL SHORING (410)(411)(423)
ITEM 416 DRILLED SHAFT FOUNDATIONS (405)(420)(421)(423)(440)(448)
ITEM 420 CONCRETE SUBSTRUCTURES (400)(404)(421)(422)(426)(427) (440)(441)(448)
ITEM 422 CONCRETE SUPERSTRUCTURES (420)(421)(424)(438)(440)(448) (454)<780>

ITEM 425 PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS (409)(420)(421)(424)(426)(427)(434)(440)(442)(445)
ITEM 432 RIPRAP (247)(420)(421)(431)(440)
ITEM 450 RAILING (420)(421)(422)(424)(440)(441)(442)(445)(446)(448)<540>
ITEM 454 BRIDGE EXPANSION JOINTS (442)
ITEM 460 CORRUGATED METAL PIPE (400)(402)(403)(445)(467)(476)
ITEM 464 REINFORCED CONCRETE PIPE (400)(402)(403)(467)(476)
ITEM 465 JUNCTION BOXES, MANHOLES, AND INLETS (400)(420)(421)(424)(440)(471)
ITEM 467 SAFETY END TREATMENT (400)(420)(421)(432)(440)(442)(445)(460)(464)
ITEM 474 LINEAR DRAINS (400)(420)(421)(440)(445)(460)(471)
ITEM 479 ADJUSTING MANHOLES AND INLETS (400)(421)(465)(471)
ITEM 480 CLEANING EXISTING CULVERTS
ITEM 496 REMOVING STRUCTURES
ITEM 500 MOBILIZATION
ITEM 502 BARRICADES, SIGNS, AND TRAFFIC HANDLING
ITEM 504 FIELD OFFICE AND LABORATORY
ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS (161)(432)(556)
ITEM 512 PORTABLE TRAFFIC BARRIER (420)(421)(424)(440)(442)
ITEM 514 PERMANENT CONCRETE TRAFFIC BARRIER (400)(416)(420)(421)(424)(440)(442)(448)
ITEM 540 METAL BEAM GUARD FENCE (421)(441)(445)<492>(529)
ITEM 542 REMOVING METAL BEAM GUARD FENCE
ITEM 543 CABLE BARRIER SYSTEM (421)(658)
ITEM 544 GUARDRAIL END TREATMENTS
ITEM 545 CRASH CUSHION ATTENUATORS (421)
ITEM 610 ROADWAY ILLUMINATION ASSEMBLIES (416)(421)(432)(441)(442)(445)(449)(614)(616)(618)(620)(622)(624)(628)
ITEM 613 HIGH MAST ILLUMINATION POLES
ITEM 614 HIGH MAST ILLUMINATION ASSEMBLIES (441)(442)(445)(613)(616)(620)(628)
ITEM 618 CONDUIT (400)(476)
ITEM 620 ELECTRICAL CONDUCTORS (610)(628)
ITEM 624 GROUND BOXES <302>(420)(421)(432)(440)(618)(620)
ITEM 628 ELECTRICAL SERVICES (441)(445)(449)(618)(620)(627)(656)
ITEM 636 SIGNS (643)
ITEM 644 SMALL ROADSIDE SIGN ASSEMBLIES (421)(440)(441)(442)(445)(636)(643)(656)
ITEM 650 OVERHEAD SIGN SUPPORTS (416)(420)(421)(441)(442)(445)(449)(618)(636)(654)
ITEM 658 DELINEATOR AND OBJECT MARKER ASSEMBLIES (445)
ITEM 662 WORK ZONE PAVEMENT MARKINGS (666)(668)(672)(677)
ITEM 666 RETROREFLECTORIZED PAVEMENT MARKINGS (316)(502)(662)(677)(678)<6438>
ITEM 668 PREFABRICATED PAVEMENT MARKINGS (678)
ITEM 672 RAISED PAVEMENT MARKERS (677)(678)
ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS (300)(302)(316)<3096>
ITEM 678 PAVEMENT SURFACE PREPARATION FOR MARKINGS (677)
ITEM 730 ROADSIDE MOWING
ITEM 734 LITTER REMOVAL

ITEM 738 CLEANING AND SWEEPING HIGHWAYS

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---008)
WAGE RATES
SPECIAL PROVISION "NONDISCRIMINATION" (000---002)
SPECIAL PROVISION "SMALL BUSINESS ENTERPRISE IN STATE FUNDED PROJECTS
                  " (000---009)
SPECIAL PROVISION "CERTIFICATE OF INTERESTED PARTIES (FORM 1295)"
                    (000--1019)
SPECIAL PROVISION "SCHEDULE OF LIQUIDATED DAMAGES" (000--1243)
SPECIAL PROVISION "NOTICE OF CONTRACTOR PERFORMANCE EVALUATIONS"
                    (000---659)
SPECIAL PROVISIONS TO ITEM   2 (002---012)(002---013)(002---014)
                                  (002---015)
SPECIAL PROVISIONS TO ITEM   3 (003---005)(003---011)(003---013)
SPECIAL PROVISIONS TO ITEM   5 (005---002)(005---003)
SPECIAL PROVISIONS TO ITEM   6 (006---001)(006---012)
SPECIAL PROVISIONS TO ITEM   7 (007---004)(007---008)(007---010)
                                  (007---011)(007---013)
SPECIAL PROVISIONS TO ITEM   8 (008---006)(008---030)(008---033)
                                  (008---045)(008---054)
SPECIAL PROVISIONS TO ITEM   9 (009---010)(009---011)
SPECIAL PROVISION TO ITEM   132 (132---002)
SPECIAL PROVISION TO ITEM   247 (247---005)
SPECIAL PROVISION TO ITEM   300 (300---020)
SPECIAL PROVISION TO ITEM   302 (302---003)
SPECIAL PROVISION TO ITEM   316 (316---002)
SPECIAL PROVISION TO ITEM   360 (360---001)
SPECIAL PROVISION TO ITEM   420 (420---001)
SPECIAL PROVISION TO ITEM   421 (421---012)
SPECIAL PROVISION TO ITEM   423 (423---007)
SPECIAL PROVISION TO ITEM   425 (425---001)
SPECIAL PROVISION TO ITEM   426 (426---005)
SPECIAL PROVISION TO ITEM   427 (427---003)
SPECIAL PROVISION TO ITEM   434 (434---004)
SPECIAL PROVISION TO ITEM   438 (438---002)
SPECIAL PROVISION TO ITEM   440 (440---005)
SPECIAL PROVISION TO ITEM   441 (441---004)
SPECIAL PROVISION TO ITEM   442 (442---001)
SPECIAL PROVISION TO ITEM   446 (446---005)
SPECIAL PROVISION TO ITEM   448 (448---001)
SPECIAL PROVISION TO ITEM   449 (449---002)
SPECIAL PROVISION TO ITEM   450 (450---001)
SPECIAL PROVISION TO ITEM   464 (464---001)
SPECIAL PROVISION TO ITEM   465 (465---001)
SPECIAL PROVISION TO ITEM   502 (502---008)
SPECIAL PROVISION TO ITEM   506 (506---005)
SPECIAL PROVISION TO ITEM   520 (520---002)

SPECIAL PROVISION TO ITEM 540 (540---001)
SPECIAL PROVISION TO ITEM 613 (613---001)
SPECIAL PROVISION TO ITEM 636 (636---001)
SPECIAL PROVISION TO ITEM 643 (643---001)
SPECIAL PROVISION TO ITEM 650 (650---001)
SPECIAL PROVISION TO ITEM 654 (654---001)
SPECIAL PROVISION TO ITEM 656 (656---001)
SPECIAL PROVISION TO ITEM 666 (666---007)
SPECIAL PROVISION TO ITEM 672 (672---001)
SPECIAL PROVISION TO SPECIAL SPECIFICATION ITEM 3096 (3096--003)
SPECIAL PROVISION TO SPECIAL SPECIFICATION ITEM 6185 (6185--002)

SPECIAL SPECIFICATIONS:

ITEM 3021 CONCRETE PAVEMENT WIDE FLANGE TERMINALS (360)(421)(440) (442)
ITEM 3096 ASPHALTS, OILS, AND EMULSIONS
ITEM 5062 PATCHING MILLED CONCRETE RUMBLE STRIPS
ITEM 6001 PORTABLE CHANGEABLE MESSAGE SIGN
ITEM 6019 LONGITUDINAL PREFABRICATED PAVEMENT MARKINGS (PPM) WITH WARRANTY (677)
ITEM 6027 PREPARATION OF EXISTING CONDUITS, GROUND BOXES, OR MANHOLES (465)(618)(624)
ITEM 6038 MULTI-POLYMER PAVEMENT MARKINGS (MPM) (677)
ITEM 6156 LED HIGH MAST ILLUMINATION ASSEMBLIES (441)(442)(445) (616)(620)
ITEM 6185 TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA) <2>
ITEM 6438 MOBILE RETROREFLECTIVITY DATA COLLECTION FOR PAVEMENT MARKINGS

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 **3510-06-027**

Project **C 3510-6-27**

Highway **SH 99**

County **HARRIS**

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 Title 10, Chapter 2258, "Prevailing Wage Rates," and is subject to the provisions of the Statute. No provisions in the Contract are intended to be in conflict with the provisions of the Statute.

The Texas Transportation 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, station work, etc. The minimum wage paid will be exclusive of equipment rental on any shipment which the worker or subcontractor may furnish in connection with his 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 Acts (FLSA) established one and one-half (1-1/2) pay for overtime in excess of 40 hours 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 in excess of 40 hours 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 hours 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 $60.00 per calendar day or portion of a calendar day for each worker that 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 (Art. 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” as set out in 29 U.S.C. 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 years 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.
- 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.

Texas Department of Transportation, as a recipient of Federal financial assistance, and under Title VI and related statutes, ensures that no person shall on the grounds of race, religion (where the primary objective of the financial assistance is to provide employment per 42 U.S.C. § 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 Texas Department of Transportation.

3. NONDISCRIMINATION PROVISIONS

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

3.1. **Compliance with Regulations**. The Contractor shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation (hereinafter, “DOT”) Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

3.2. **Nondiscrimination**. The contractor, with regard to the work performed by it during the contract, shall 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 shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

3.3. **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, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

3.4. **Information and Reports:** The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Texas Department of Transportation 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 shall so certify to the Recipient, or the Texas Department of Transportation as appropriate, and shall 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 shall impose such contract sanctions as it or the Texas Department of Transportation may determine to be appropriate, including, but not limited to:

- withholding of payments to the contractor under the contract until the contractor complies, and/or
- cancellation, termination or suspension of the contract, in whole or in part.

3.6. **Incorporation of Provisions**. The contractor shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Recipient or the Texas Department of Transportation may direct as a means of enforcing such provisions including sanctions for non-compliance: Provided, however, that, in the event 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 to Item 000
Small Business Enterprise in State Funded Projects

1. DESCRIPTION

The purpose of this Special Provision is to carry out the Texas Department of Transportation's policy of ensuring that Small Business Enterprise (SBE) has an opportunity to participate in the performance of contracts. If the SBE goal is greater than zero, Article A of this Special Provision shall apply to this Contract; otherwise, Article B of this Special Provision applies. The percentage goal for SBE participation in the work to be performed under this contract will be shown in the proposal.

2. DEFINITIONS

Small Business Enterprise (SBE) is a firm (including affiliates) certified by the Department whose annual gross receipts do not exceed the U.S. Small Business Administration's size standards for 4 consecutive years. 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. In this regard, it is the Department's policy to develop and maintain a program in order to facilitate contracting opportunities for small businesses. Consequently, the requirements of the Department's Small Business Enterprise Program apply to this contract as follows:

2.1.1.1. The Contractor shall make a good faith effort to meet the SBE goal for this contract.

2.1.1.2. The Contractor and any Subcontractors shall 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 shall be incorporated into any subcontract and purchase order.

2.1.1.3. 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, as is outlined under Section 2, "Contractor's Responsibilities." If the requirements of Section 2 are met, the contract will be forwarded to the Contractor for execution.

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

2.1.2. **Contractor's Responsibilities**. These requirements must be satisfied by the Contractor. A SBE Contractor may satisfy the SBE requirements by performing at least 25% of the contract work with its own organization as defined elsewhere in the contract.

2.1.2.1. The Contractor shall submit a completed SBE Commitment Agreement Form for each SBE they intend to use to satisfy the SBE goal so as to arrive in the Department's Office of Civil Rights (OCR) in Austin, Texas not later than 5:00 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.

2.1.2.2. A Contractor who cannot meet the contract goal, in whole or in part, shall 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 a SBE goal or obtain SBE participation, including:

2.1.2.2.1. Advertising in general circulation, trade association, and/or minority/women focus media concerning subcontracting opportunities,

2.1.2.2.2. Dividing the contract work into reasonable portions in accordance with standard industry practices,

2.1.2.2.3. Documenting reasons for rejection or meeting with the rejected SBE to discuss the rejection,

2.1.2.2.4. Providing qualified SBEs with adequate information about bonding, insurance, plans, specifications, scope of work, and the requirements of the contract,

2.1.2.2.5. Negotiating in good faith with qualified SBEs, not rejecting qualified SBEs who are also the lowest responsive bidder, and;

2.1.2.2.6. 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.

2.1.2.3. The good faith effort documentation is due at the time and place specified in Subarticle 2.(a). of this Special Provision. The Director of the DBE & SBE Programs Section 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.

2.1.2.4. Should the bidder to whom the contract is conditionally awarded refuse, neglect or fail to meet the SBE goal and/or demonstrate to the Department's satisfaction sufficient efforts to obtain SBE participation, the proposal guaranty filed with the bid shall become the property of the State, not as a penalty, but as liquidated damages to the Department.

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

2.1.2.6. The Contractor shall designate a 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.

2.1.2.7. 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.**

2.1.3.1. The Department certifies the eligibility of SBEs.

2.1.3.2. The Department maintains and makes available to interested parties a directory of certified SBEs.

2.1.3.3. 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 required under Section 2.(a) above.

2.1.3.4. Certified HUBs and DBEs are eligible as SBEs.

2.1.3.5. Small Business Size Regulations and Eligibility is referenced on e-CFR (Code of Federal Regulations), Title 13 – Business Credit and Assistance, Chapter 1 – Small Business Administration, Part 121 – Small Business Size Regulations, Subpart A – Size Eligibility Provisions and Standards.

2.1.4. **Determination of SBE Participation**. SBE participation shall be counted toward meeting the SBE goal in this contract in accordance with the following:

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

2.1.4.2. A SBE Contractor or subcontractor may not subcontract more than 75% of a contract. The SBE shall perform not less than 25% of the value of the contract work with its own organization.

2.1.4.3. A SBE may lease equipment consistent with standard industry practice. A 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 prior to the SBE starting the work in accordance with the following:

2.1.4.3.1. 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 shall 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 job site.

2.1.4.3.2. For equipment that is not specialized, the SBE shall provide the operator and be responsible for all payroll and labor compliance requirements.

2.1.5. **Records and Reports**.

2.1.5.1. The Contractor shall submit monthly reports, after work begins, on SBE payments, (including payments to HUBs and DBEs). The monthly reports are to be sent to the Area Engineer's office. 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" is to be used for monthly reporting. Upon completion of the contract and prior to receiving the final payment, the Contractor shall submit the "SBE Final Report" to the Office of Civil Rights and a copy to the Area Engineer. These forms may be obtained from the Office of Civil Rights and reproduced as necessary. The Department may verify the amounts being reported as paid to SBEs by requesting, on a random basis, copies of invoices and cancelled checks paid to SBEs. When the SBE goal requirement is not met, documentation supporting Good Faith Efforts, as outlined in Section 2.(b) of this Special Provision, must be submitted with the Final Report.

2.1.5.2. SBE subcontractors and/or 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 or not SBE activity has occurred in the monthly reporting period.**

2.1.5.3. All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the Department.

2.1.6. **Compliance of Contractor**. To ensure that SBE requirements of this contract are complied with, 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 his 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 shall 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 policy of the Department that SBEs shall have an opportunity to participate in the performance of contracts. Consequently, the requirements of the Department's Small Business Enterprise Program apply to this contract as specified in Section 2-5 of this Article.

2.2.2. **Contractor's Responsibilities**. If there is no SBE goal, the Contractor will offer SBEs an opportunity to participate in the performance of contracts and subcontracts.

2.2.3. **Prohibit Discrimination**. The Contractor and any subcontractor shall 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 shall be incorporated into any subcontract and purchase order.

2.2.4. **Records and Reports**.

2.2.4.1. The Contractor shall submit reports on SBE (including HUB and DBE) payments. The reports are to be sent to the Area Engineer's office. These reports will be due annually by the 31st of August 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" is to be used for reporting. Upon completion of the contract and prior to receiving the final payment, the Contractor shall submit the "SBE Final Report" to the Office of Civil Rights and a copy to the Area Engineer. These forms may be obtained from the Office of Civil Rights and reproduced as necessary. The Department may verify the amounts being reported as paid to SBEs by requesting copies of invoices and cancelled checks paid to SBEs on a random basis.

2.2.4.2. SBE subcontractors and/or suppliers should be identified on the report by SBE Certification Number, name and the amount of actual payment made.

2.2.4.3. All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the Department.

Special Provision 000
Certificate of Interested Parties (Form 1295)

Submit a notarized 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 $1,000,000 or more; at any time an existing Contract awarded by the District Engineer or Chief Engineer increases in value to $1,000,000 or more due to changes in the Contract; at any time there is an increase of $1,000,000 or more to an existing Contract (change orders, extensions, and renewals); or
- 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 on completing and filing the form are available on the Texas Ethics Commission website.

Special Provision 000
Important Notice to Contractors

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	1317
15,000,000	25,000,000	1718
25,000,000	50,000,000	2411
50,000,000	Over 50,000,000	4265

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 000
Notice of Contractor Performance Evaluations

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. DEFINITIONS

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 Title 43, Texas Administrative Code (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 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.

In accordance with 43 TAC §9.23, the Division will request a CAP if the average of the Contractor's statewide final evaluation scores falls below the Department's acceptable standards for the review period and will monitor the Contractor's compliance with the established plan.

3. CONTRACTOR EVALUATIONS

In accordance with Title 43, Texas Administrative Code (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 non-compliance is final.

4. DIVISION OVERSIGHT

Upon request of the Construction 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 to Item 002
Instructions to Bidders

Item 2, "Instructions to Bidders," 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 2., "Eligibility of Bidders," is supplemented by the following:

2.3. **Technical Prequalification.** A technical pre-qualification is required of the Contractor to whom the Contract is awarded, prior to the commencement of rail construction activity, and is in addition to all other bidder pre-qualification requirements set forth by the Construction Division of the Texas Department of Transportation . To pre-qualify, file acceptable documentation demonstrating the capability of the Contractor or the Contractor's designated subcontractors to perform the specific categories of work that are described below which apply to this Contract. The categories of work that apply to this Contract are listed in the "Important Notice to Contractors" Special Provision in the Contract.

Submit completed pre-qualification documents at least 20 working days prior to beginning rail construction activities to the Rail Division – Rail Planning and Programs Section, Texas Department of Transportation, 125 East 11th Street, Austin, Texas, 78701- 2483 or via email to RRD_RailPlan@txdot.gov. The Department will respond no later than 5 days after receipt of the submission. Any documentation which does not correctly address all specified items will be rejected for the reason of insufficient data and additional information must be provided. Submit pre-qualification documentation under cover letter from the Contractor.

As an option to submitting for contractors/subcontractors for approval for the project, the Contractor may use Category approved railroad work prequalified contractors/subcontractors shown on the Department's Website's Material Producers List (MPL) of Railroad Work Prequalified Contractors/Subcontractors.

Should the Contractor have approved subcontractors which meet the requirements, in Section 2.2.3, and should these subcontractors be unable to complete the entire project, the Contractor must resubmit technical pre-qualification material on alternate subcontractors for approval before the applicable category of work can be continued.

2.3.1. **Category A.1.0. Trackwork.**

The contractor or the designated subcontractor must meet the following experience requirements:

2.3.1.1. Two years continuous existence offering services in the construction of new track and existing track rehabilitation including the removal and installation of concrete railroad crossties; timber railroad crossties; crosstie securement; installation of continuously welded rail; installation of jointed rail; track gauging; turnouts; remotely controlled switches; hand operated switches; concrete and timber vehicular grade crossings.

2.3.1.2. Four completed projects where the personnel constructed a minimum of 5,280 track feet of new track on newly constructed track bed.

2.3.2. **Category A.2.0. Ballasting and Surfacing.**

The bidder or the designated subcontractor must meet the following experience requirements:

2.3.2.1. Two years continuous existence offering services in the ballasting and surfacing of railroad trackwork, including new track construction and tie replacement projects.

Experience must include the following:
- furnishing, delivery and unloading of ballast to project site,
- distribution, tamping, raising, lining, and surfacing of the track, with the finished surface of the ballast dressed in accordance with project instructions, and
- track construction and surfacing to the alignment and grade prescribed by the project plans.

2.3.2.2. Four completed projects where the personnel performed unloading, distribution, tamping, raising, lining, and surfacing of the track during the course of the project. Each project must have consisted of a minimum of 5,280 track feet of such work. The completed track work must have been in continuous satisfactory operation for a minimum of 1 yr.

2.3.3 Category A.3.0. Timber Rail Bridge Rehabilitation.

The contractor or the designated subcontractor must meet the following experience requirements:

2.3.3.1. Two years continuous existence offering services in rehabilitation of timber railroad bridges, including repairs to the superstructure and substructure.

Experience must include the following:
- furnishing, delivery and unloading of materials to project site,
- timber pile replacement, timber pile posting, timber stringer replacement, installing timber helper stringers, timber bracing, timber curbs, timber caps, timber sills, timber bulkheads, replacement of cross ties on ballasted-deck and open deck timber bridges, securement of timber rail bridge components; and
- track construction and surfacing on timber rail bridges to the alignment and grade prescribed by the project plans.

2.3.3.2. Four completed projects where the personnel performed repair or rehabilitation of timber rail bridges. The projects must have included each type of work listed above on at least 12 or more timber rail bridges. The completed work must have been in continuous satisfactory operation for a minimum of 1 yr.

2.3.4 Category A.4.0. Grade Crossing Signal System Installation and Rehabilitation.

The contractor or the designated subcontractor must meet the following experience requirements:

2.3.4.1. Two years continuous existence offering services in the installation, rehabilitation, and repair of highway-rail grade crossing signal systems.

Experience must include the following:
- furnishing, delivery and unloading of materials to project site, and
- installing narrow-band multi-shunts; installing track wire; installing welded rail bonds; installing insulated and non-insulated joints; installing grade crossing signal cabinets; installing grade crossing signal masts, lights, gates, and cantilevers; wiring grade crossing signal cabinets and light systems; installation, adjustment, and replacement of highway-rail grade crossing signal system controls including traffic signal preemption systems.

2.3.3.2. Four completed projects where the personnel performed installation, repair, replacement or rehabilitation of grade crossing signal systems and components. Each project must have consisted of a minimum of 2 grade crossing locations including such work. The completed grade crossing work must have been in continuous satisfactory operation for a minimum of 1 yr.

Special Provision to Item 2
Instructions to Bidders

Item 2, "Instructions to Bidders" 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 3., "Issuing Proposal Forms," is supplemented by the following:

The Electronic State Business Daily (ESBD), the Integrated Contractor Exchange (iCX) system, and the project proposal are the official sources of advertisement and bidding information for the State and Local Lettings. Bidders should bid the project using the information found therein, including any addenda. These sources take precedence over information from other sources, including TxDOT webpages, which are unofficial and intended for informational purposes only.

Special Provision to Item 2
Instructions to Bidders

Item 2, "Instructions to Bidders," 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.

Section 2.8.2., "Proposal Guaranty," third paragraph is replaced by the following.

It is the Bidder's responsibility to ensure the electronic bid bond is issued in the name or Department vendor identification numbers of the Bidder or Bidders.

Special Provision to Item 2
Instructions to Bidders

Item 2, "Instructions to Bidders," 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 2.3., "Issuing Proposal Forms," is supplemented by the following:

- the Bidder or affiliate of the Bidder that was originally determined as the apparent low Bidder on a project but was deemed nonresponsive for failure to register or participate in the Department of Homeland Security's (DHS) E-Verify system as specified in Article 2.15., "Department of Homeland Security (DHS) E-Verify System," is prohibited from rebidding that specific project.

Article 2.7., "Nonresponsive Bid," is supplemented by the following:

- the Bidder failed to participate in the Department of Homeland Security's (DHS) as specified in Article 2.15., "Department of Homeland Security (DHS) E-Verify System."

Article 2.15., "Department of Homeland Security (DHS) E-Verify System," is added.

The Department will not award a Contract to a Contractor that is not registered in the DHS E-Verify system. Remain active in E-Verify throughout the life of the Contract. In addition, in accordance with paragraph six of Article 8.2., "Subcontracting," include this requirement in all subcontracts and require that subcontractors remain active in E-Verify until their work is completed.

If the apparent low Bidder does not appear in the DHS E-Verify system before award, the Contractor must submit documentation showing that they are compliant within 5 calendar days after bid opening. A Contractor that fails to comply or respond within the deadline will be declared nonresponsive. The Bidder forfeiting the proposal guaranty will not be considered in future proposals for the same work unless there has been a substantial change in the scope of the work.

The Department may recommend that the Commission:

- reject all bids, or
- award the Contract to the new apparent low Bidder, if the Department is able to verify the Bidder's participation in the DHS E-Verify system.

If the Department is unable to verify the new apparent low Bidder's participation in the DHS E-Verify system:

- the new apparent low Bidder will not be deemed nonresponsive,
- the new apparent low Bidder's guaranty will not be forfeited,
- the Department will reject all bids,
- the new apparent low Bidder will remain eligible to receive future proposals for the same project, and
- the proposal guaranty of the original low bidder will become the property of the State, not as a penalty, but as liquidated damages.

Special Provision to Item 3
Award and Execution of Contract

Item 3, "Award and Execution of Contract" 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.

Section 4.2., "Bonds," is supplemented by the following:

On the Department's form, provide a warranty bond executed by either the manufacturer of the warranted items or the Contractor, and a U. S. Treasury listed surety with attached powers of attorney and notification information. The warranty bond will be for the total amount of the items that are warranted and furnished as a guarantee for the protection of the Department for all labor, materials, equipment and other incidentals for the replacement of defective work. The party providing the warranty bond is responsible for meeting the warranty requirements.

Special Provision to Item 3
Award and Execution Contract

Item 3, Award and Execution of Contract," 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.

Section 4.3, "Insurance." The first sentence is voided and replaced by the following:

For construction and building Contracts, submit a certificate of insurance showing coverages in accordance with Contract requirements. For routine maintenance Contracts, refer to Article 8, "Beginning of Work."

Article 8, "Beginning of Work." The first sentence is supplemented by the following:

For a routine maintenance Contract, do not begin work until a certificate of insurance showing coverages in accordance with the Contract requirements is provided and accepted.

Special Provision to Item 3
Award and Execution of Contract

Item 3, "Award and Execution of Contract" 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.

Section 4.3 "Insurance" is being amended by the following:

Table 2
Insurance Requirements

Type of Insurance	Amount of Coverage
Commercial General Liability Insurance	Not Less Than: $600,000 each occurrence
Business Automobile Policy	Not Less Than: $600,000 combined single limit
Workers' Compensation	Not Less Than: Statutory
All Risk Builder's Risk Insurance (For building-facilities contracts only)	100% of Contract Price

Special Provision to Item 5
Control of the Work

Item 5, "Control of the Work," 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 5.1, "Authority of Engineer," is voided and replaced by the following.

The Engineer has the authority to observe, test, inspect, approve, and accept the work. The Engineer decides all questions about the quality and acceptability of materials, work performed, work progress, Contract interpretations, and acceptable Contract fulfillment. The Engineer has the authority to enforce and make effective these decisions.

The Engineer acts as a referee in all questions arising under the terms of the Contract. The Engineer's decisions will be final and binding.

The Engineer will pursue and document actions against the Contractor as warranted to address Contract performance issues. Contract remedies include, but are not limited to, the following:

- conducting interim performance evaluations requiring a Project Recovery Plan, in accordance with Title 43, Texas Administrative Code (TAC) §9.23,
- requiring the Contractor to remove and replace defective work, or reducing payment for defective work,
- removing an individual from the project,
- suspending the work without suspending working day charges,
- assessing standard liquidated damages to recover the Department's administrative costs, including additional project-specific liquidated damages when specified in the Contract in accordance with 43 TAC §9.22,
- withholding estimates,
- declaring the Contractor to be in default of the Contract, and
- in case of a Contractor's failure to meet a Project Recovery Plan, referring the issue directly to the Performance Review Committee for consideration of further action against the Contractor in accordance with 43 TAC §9.24.

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

Follow the issue escalation ladder if there is disagreement regarding the application of Contract remedies.

Special Provision to Item 5
Control of the Work

Item 5, “Control of the Work” 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 5.4, “Coordination of Plans, Specifications, and Special Provisions,” the last sentence of the last paragraph is replaced by the following:

Failure to promptly notify the Engineer will constitute a waiver of all contract claims against the Department for misunderstandings or ambiguities that result from the errors, omissions, or discrepancies.

Special Provision to Item 6
Control of Materials

For this project, Item 6, "Control of Materials," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 4., "Sampling, Testing, and Inspection," is supplemented by the following:

Meet with the Engineer and choose either the Department or a Department-selected Commercial Lab (CL) for conducting the subset of project-level sampling and testing shown in Table 1, "Select Guide Schedule Sampling and Testing." Selection may be made on a test by test basis. CLs will meet the testing turnaround times shown (includes test time and time for travel/sampling and reporting) and in all cases issue test reports as soon as possible.

If the Contractor chooses a Department-selected CL for any Table 1 sampling and testing:

- notify the Engineer, District Lab, and the CL of project scheduling that may require CL testing;
- provide the Engineer, District Lab, and CL at least 24 hours' notice by phone and e-mail;
- reimburse the Department for CL Table 1 testing using the contract fee schedule for the CL (including mileage and travel/standby time) at the minimum guide schedule testing frequencies;
- reimburse the Department for CL Table 1 testing above the minimum guide schedule frequencies for retesting when minimum frequency testing results in failures to meet specification limits;
- agree with the Engineer and CL upon a policy regarding notification for testing services;
- give any cancellation notice to the Engineer, District Lab, and CL by phone and e-mail;
- reimburse the Department a $150 cancellation fee to cover technician time and mileage charges for previously scheduled work cancelled without adequate notice, which resulted in mobilization of technician and/or equipment by the CL; and
- all CL charges will be reimbursed to the Department by a deduction from the Contractor's monthly pay estimate.

If the CL does not meet the Table 1 turnaround times, testing charge to the Contractor will be reduced by 50% for the first late day and an additional 5% for each succeeding late day.

Approved CL project testing above the minimum testing frequencies in the Guide Schedule of Sampling and Testing, and not as the result of failing tests, will be paid by the Department.

Other project-level Guide Schedule sampling and testing not shown on Table 1 will be the responsibility of the Department.

Table 1
Select Guide Schedule Sampling and Testing (Note 1)

TxDOT Test	Test Description	Turn-Around Time (Calendar days)
SOILS/BASE		
Tex-101-E	Preparation of Soil and Flexible Base Materials for Testing (included in other tests)	
Tex-104-E	Liquid Limit of Soils (included in 106-E)	
Tex-105-E	Plastic Limit of Soils (included in 106-E)	
Tex-106-E	Calculating the Plasticity Index of Soils	7
Tex-110-E	Particle Size Analysis of Soils	6
Tex-113-E	Moisture-Density Relationship of Base Materials	7
Tex-114-E	Moisture-Density Relationship of Subgrade and Embankment Soil	7
Tex-115-E	Field Method for In-Place Density of Soils and Base Materials	2
Tex-116-E	Ball Mill Method for the Disintegration of Flexible Base Material	5
Tex-117-E, Part II	Triaxial Compression Tests For Disturbed Soils and Base Materials (Part II)	6
Tex-113-E **w/** Tex-117-E	Moisture-Density Relationship of Base Materials **with** Triaxial Compression Tests For Disturbed Soils and Base Materials (Part II)	10
Tex-140-E	Measuring Thickness of Pavement Layer	2
Tex-145-E	Determining Sulfate Content in Soils - Colorimetric Method	4
HOT MIX ASPHALT		
Tex-200-F	Sieve Analysis of Fine and Coarse Aggregate (dry, from ignition oven with known correction factors)	1 (Note 2)
Tex-203-F	Sand Equivalent Test	3
Tex-206-F, **w/** Tex-207-F, Part I, **w/** Tex-227-F	**(Lab-Molded Density of Production Mixture – Texas Gyratory)** Method of Compacting Test Specimens of Bituminous Mixtures **with** Density of Compacted Bituminous Mixtures, Part I - Bulk Specific Gravity of Compacted Bituminous Mixtures, **with** Theoretical Maximum Specific Gravity of Bituminous Mixtures	1 (Note 2)
Tex-207-F, Part I **&/or** Part VI	**(In-Place Air Voids of Roadway Cores)** Density of Compacted Bituminous Mixtures, Part I- Bulk Specific Gravity of Compacted Bituminous Mixtures **&/or** Part VI - Bulk Specific Gravity of Compacted Bituminous Mixtures Using the Vacuum Method	1 (Note 2)
Tex-207-F, Part V	Density of Compacted Bituminous Mixtures, Part V- Determining Mat Segregation using a Density-Testing Gauge	3
Tex-207-F, Part VII	Density of Compacted Bituminous Mixtures, Part VII - Determining Longitudinal Joint Density using a Density-Testing Gauge	4
Tex-212-F	Moisture Content of Bituminous Mixtures	3
Tex-217-F	Deleterious Material and Decantation Test for Coarse Aggregate	4
Tex-221-F	Sampling Aggregate for Bituminous Mixtures, Surface Treatments, and LRA (included in other tests)	
Tex-222-F	Sampling Bituminous Mixtures (included in other tests)	
Tex-224-F	Determination of Flakiness Index	3
Tex-226-F	Indirect Tensile Strength Test (production mix)	4
Tex-235-F	Determining Draindown Characteristics in Bituminous Materials	3
Tex-236-F (Correction Factors)	Asphalt Content from Asphalt Paving Mixtures by the Ignition Method (Determining Correction Factors)	4
Tex-236-F	Asphalt Content from Asphalt Paving Mixtures by the Ignition Method (Production Mixture)	1 (Note 2)
Tex-241-F **w/** Tex-207-F, Part I, **w/** Tex-227-F	**(Lab-Molded Density of Production Mixture – Superpave Gyratory)** Superpave Gyratory Compacting of Specimens of Bituminous Mixtures (production mixture) **with** Density of Compacted Bituminous Mixtures, Part I- Part I - Bulk Specific Gravity of Compacted Bituminous Mixtures, **with** Theoretical Maximum Specific Gravity of Bituminous Mixtures	1 (Note 2)
Tex-242-F	Hamburg Wheel-Tracking Test (production mix, molded samples)	3
Tex-244-F	Thermal Profile of Hot Mix Asphalt	1
Tex-246-F	Permeability of Water Flow of Hot Mix Asphalt	3
Tex-280-F	Flat and Elongated Particles	3
Tex-530-C	Effect of Water on Bituminous Paving Mixtures (production mix)	4

AGGREGATES		
Tex-400-A	Sampling Flexible Base, Stone, Gravel, Sand, and Mineral Aggregates	3
Tex-410-A	Abrasion of Coarse Aggregate Using the Los Angeles Machine	5
Tex-411-A	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate	12
Tex-461-A	Degradation of Coarse Aggregate by Micro-Deval Abrasion	5
CHEMICAL		
Tex-612-J	Acid Insoluble Residue for Fine Aggregate	4
GENERAL		
HMA Production Specialist [TxAPA – Level 1-A] ($/hr)		
HMA Roadway Specialist [TxAPA – Level 1-B] ($/hr)		
Technician Travel/Standby Time ($/hr)		
Per Diem ($/day – meals and lodging)		
Mileage Rate ($/mile from closest CL location)		

Note 1– Turn-Around Time includes test time and time for travel/sampling and reporting.
Note 2 – These tests require turn-around times meeting the governing specifications. Provide test results within the stated turn-around time. CL is allowed one additional day to provide the signed and sealed report.

Special Provision to Item 6
Control of Materials

Item 6, "Control of Materials" 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 6.10., "Hazardous Materials," is voided and replaced by the following:

Comply with the requirements of Article 7.12., "Responsibility for Hazardous Materials."

Notify the Engineer immediately when a visual observation or odor indicates that materials on sites owned or controlled by the Department may contain hazardous materials. Except as noted herein, the Department is responsible for testing, removing, and disposing of hazardous materials not introduced by the Contractor. The Engineer may suspend work wholly or in part during the testing, removing, or disposing of hazardous materials, except in the case where hazardous materials are introduced by the Contractor.

Use materials that are free of hazardous materials. Notify the Engineer immediately if materials are suspected to contain hazardous materials. If materials delivered to the project by the Contractor are suspected to contain hazardous materials, have an approved commercial laboratory test the materials for the presence of hazardous materials as approved. Remove, remediate, and dispose of any of these materials found to contain hazardous materials. The work required to comply with this section will be at the Contractor's expense if materials are found to contain hazardous materials. Working day charges will not be suspended and extensions of working days will not be granted for activities related to handling hazardous material introduced by the Contractor. If suspected materials are not found to contain hazardous materials, the Department will reimburse the Contractor for hazardous materials testing and will adjust working day charges if the Contractor can show that this work impacted the critical path.

10.1. Painted Steel Requirements. Coatings on existing steel contain hazardous materials unless otherwise shown on the plans. Remove paint and dispose of steel coated with paint containing hazardous materials is in accordance with the following:

10.1.1. Removing Paint From Steel For contracts that are specifically for painting steel, Item 446, "Field Cleaning and Painting Steel" will be included as a pay item. Perform work in accordance with that item.

For projects where paint must be removed to allow for the dismantling of steel or to perform other work, the Department will provide for a separate contractor (third party) to remove paint containing hazardous materials prior to or during the Contract. Remove paint covering existing steel shown not to contain hazardous materials in accordance with Item 446, "Field Cleaning and Painting Steel."

10.1.2. Removal and Disposal of Painted Steel. For steel able to be dismantled by unbolting, paint removal will not be performed by the Department. The Department will remove paint, at locations shown on the plans or as agreed, for the Contractor's cutting and dismantling purposes. Utilize Department cleaned locations for dismantling when provided or provide own means of dismantling at other locations.

Painted steel to be retained by the Department will be shown on the plans. For painted steel that contains hazardous materials, dispose of the painted steel at a steel recycling or smelting facility unless otherwise shown on the plans. Maintain and make available to the Engineer invoices and other records obtained from the facility showing the received weight of the steel and the facility name. Dispose of steel that does not contain hazardous material coatings in accordance with federal, state and local regulations.

10.2. Asbestos Requirements. The plans will indicate locations or elements where asbestos containing materials (ACM) are known to be present. Where ACM is known to exist or where previously unknown ACM has been found, the Department will arrange for abatement by a separate contractor prior to or during the Contract. Notify the Engineer of proposed dates of demolition or removal of structural elements with ACM at least 60 days before beginning work to allow the Department sufficient time for abatement.

The Department of State Health Services (DSHS), Asbestos Programs Branch, is responsible for administering the requirements of the National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 61, Subpart M and the Texas Asbestos Health Protection Rules (TAHPR). Based on EPA guidance and regulatory background information, bridges are considered to be a regulated “facility” under NESHAP. Therefore, federal standards for demolition and renovation apply.

The Department is required to notify the DSHS at least 10 working days (by postmarked date) before initiating demolition or renovation of each structure or load bearing member shown on the plans. If the actual demolition or renovation date is changed or delayed, notify the Engineer in writing of the revised dates in sufficient time to allow for the Department’s notification to DSHS to be postmarked at least 10 days in advance of the actual work.

Failure to provide the above information may require the temporary suspension of work under Article 8.4., “Temporary Suspension of Work or Working Day Charges,” due to reasons under the control of the Contractor. The Department retains the right to determine the actual advance notice needed for the change in date to address post office business days and staff availability.

10.3. Lead Abatement. Provide traffic control as shown on the plans, and coordinate and cooperate with the third party and the Department for managing or removing hazardous materials. Work for the traffic control shown on the plans and coordination work will not be paid for directly but will be subsidiary to pertinent Items.

Special Provision to Item 7
Legal Relations and Responsibilities

Item 7, "Legal Relations and Responsibilities," 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.

Section 7.7.2., "Texas Pollutant Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention Plans (SWP3)," is voided and replaced by the following:

7.2. Texas Pollution Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention Plans (SWP3).

7.2.1. Projects with less than one acre of soil disturbance including required associated project specific locations (PSL's) per TPDES GP TXR 150000.

No posting or filing will be required for soil disturbances within the right of way. Adhere to the requirements of the SWP3.

7.2.2. Projects with one acre but less than five acres of soil disturbance including required associated PSL's per TPDES GP TXR 150000.

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activity in the right of way. The Department will post a small site notice along with other requirements as defined in TPDES GP TXR 150000 as the entity of having operational control over plans and specifications for work shown on the plans in the right of way.

The Contractor will be considered a Primary Operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activity in the right of way. In addition to the Department's actions, the Contractor will post a small site notice along with other requirements as defined in TPDES GP TXR 150000 as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans. The Contractor will be responsible for Implement the SWP3 for the project site in accordance with the plans and specifications, TPDES General Permit TXR150000, and as directed.

7.2.3. Projects with 5 acres or more of soil disturbance including required associated PSL's per TPDES GP TXR 150000.

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activities in the right of way. The Department will post a large site notice, file a notice of intent (NOI), notice of change (NOC), if applicable, and a notice of termination (NOT) along with other requirements per TPDES GP TXR 150000 as the entity having operational control over plans and specifications for work shown on the plans in the right of way.

The Contractor will be considered a primary operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activities in the right of way. In addition to the Department's actions, the Contractor shall file a NOI, NOC, if applicable, and NOT and post a large site notice along with other requirements as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor

being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans.

Special Provision to Item 7
Legal Relations and Responsibilities

Item 7, "Legal Relations and Responsibilities" 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.

Section 19.1., Minimum Wage Requirements for Federally Funded Contracts. The second paragraph is voided and replaced by the following:

Submit electronic payroll records to the Engineer using the Department's payroll system.

Section 19.2., Minimum Wage Requirements for State Funded Contracts. The second paragraph is voided and replaced by the following:

Submit electronic payroll records to the Engineer using the Department's payroll system.

Special Provision to Item 7
Legal Relations and Responsibilities

Item 7, "Legal Relations and Responsibilities," 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.

Section 7.2.4., "Public Safety and Convenience." The first paragraph is deleted and replaced by the following.

Ensure the safety and convenience of the public and property as provided in the Contract and as directed. Keep existing roadways open to traffic or construct and maintain detours and temporary structures for safe public travel. Manage construction to minimize disruption to traffic. Maintain the roadway in a good and passable condition, including proper drainage and provide for ingress and egress to adjacent property.

If the construction of the project requires the closing of a highway, as directed, coordinate the closure with the Engineer and work to ensure all lanes and ramps possible are available during peak traffic periods before, during, and after significant traffic generator events to avoid any adverse economic impact on the municipalities during:

- dates or events as shown on the plans, and
- other dates as directed.

Special Provision to Item 007
Legal Relations and Responsibilities

Item 7, "Legal Relations and Responsibilities," of the Standard Specifications is amended with respect to the clauses cited below.

Section 2.6., "Barricades, Signs, and Traffic Handling," the first paragraph is voided and replaced by the following:

2.6. **Barricades, Signs, and Traffic Handling.** Comply with the requirements of Item 502 "Barricades, Signs, and Traffic Handling," and as directed. Provide traffic control devices that conform to the details shown on the plans, the TMUTCD, and the Department's Compliant Work Zone Traffic Control Device List maintained by the Traffic Safety Division. When authorized or directed, provide additional signs or traffic control devices not required by the plans.

Section 2.6.1., "Contractor Responsible Person and Alternative," is voided and replaced by the following:

2.6.1. **Contractor Responsible Person and Alternative.** Designate in writing, a Contractor's Responsible Person (CRP) and an alternate to be the representative of the Contractor who is responsible for taking or directing corrective measures regarding the traffic control. The CRP or alternate must be accessible by phone 24 hr. per day and able to respond when notified. The CRP and alternate must comply with the requirements of Section 2.6.5., "Training."

Section 2.6.2, "Flaggers," the first paragraph is voided and replaced by the following:

2.6.2. **Flaggers.** Designate in writing, a flagger instructor who will serve as a flagging supervisor and is responsible for training and assuring that all flaggers are qualified to perform flagging duties. Certify to the Engineer that all flaggers will be trained and make available upon request a list of flaggers trained to perform flagging duties.

Section 2.6.5, "Training," is voided and replaced by the following:

2.6.5. **Training.** Train workers involved with the traffic control using Department-approved training as shown on the "Traffic Control Training" Material Producer List.

Coordinate enrollment, pay associated fees, and successfully complete Department-approved training or Contractor-developed training. Training is valid for the period prescribed by the provider. Except for law enforcement personnel training, refresher training is required every 4 yr. from the date of completion unless otherwise specified by the course provider. The Engineer may require training at a frequency instead of the period prescribed based on the Department's needs. Training and associated fees will not be measured or paid for directly but are considered subsidiary to pertinent Items.

Certify to the Engineer that workers involved in traffic control and other work zone personnel have been trained and make available upon request a copy of the certification of completion to the Engineer. Ensure the following is included in the certification of completion:

- name of provider and course title,
- name of participant,
- date of completion, and
- date of expiration.

Where Contractor-developed training or a Department-approved training course does not produce a certification, maintain a log of attendees. Make the log available upon request. Ensure the log is legible and includes the following:

- printed name and signature of participant,
- name and title of trainer, and
- date of training.

2.6.5.1. **Contractor-developed Training.** Develop and deliver Contractor-developed training meeting the minimum requirements established by the Department. The outline for this training must be submitted to the Engineer for approval at the preconstruction meeting. The CRP or designated alternate may deliver the training instead of the Department-approved training. The work performed and materials furnished to develop and deliver the training will not be measured or paid for directly but will be considered subsidiary to pertinent Items.

2.6.5.1.1. **Flagger Training Minimum Requirements.** A Contractor's certified flagging instructor is permitted to train other flaggers.

2.6.5.1.2. **Optional Contractor-developed Training for Other Work Zone Personnel.** For other work zone personnel, the Contractor may provide training meeting the curriculum shown below instead of Department-approved training.

Minimum curriculum for Contractor-provided training is as follows:

Contractor-developed training must provide information on the use of personnel protection equipment, occupational hazards and health risks, and other pertinent topics related to traffic management. The type and amount of training will depend on the job duties and responsibilities. Develop training applicable to the work being performed. Develop training to include the following topics.

- The Life You Save May Be Your Own (or other similar company safety motto).
- Purpose of the training.
  - It's the Law.
  - To make work zones safer for workers and motorist.
  - To understand what is needed for traffic control.
  - To save lives including your own.
- Personal and Co-Worker Safety.
  - **High Visibility Safety Apparel.** Discuss compliant requirements; inspect regularly for fading and reduced reflective properties; if night operations are required, discuss the additional and appropriate required apparel in addition to special night work risks; if moving operations are underway, discuss appropriate safety measures specific to the situation and traffic control plan.
  - **Blind Areas.** A blind area is the area around a vehicle or piece of construction equipment not visible to the operators, either by line of sight or indirectly by mirrors. Discuss the "Circle of Safety" around equipment and vehicles; use of spotters; maintain eye contact with equipment operators; and use of hand signals.
  - **Runovers and Backovers.** Remain alert at all times; keep a safe distance from traffic; avoid turning your back to traffic and if you must then use a spotter; and stay behind protective barriers, whenever possible. Note: It is not safe to sit on or lean against a concrete barrier, these barriers can deflect four plus feet when struck by a vehicle.
  - Look out for each other, warn co-workers.
  - Be courteous to motorists.
  - Do not run across active roadways.
  - Workers must obey traffic laws and drive courteously while operating vehicles in the work zones.
  - Workers must be made aware of company distracted driving policies.
- **Night Time Operations.** Focus should be placed on projects with a nighttime element.

- **Traffic Control Training.** Basics of Traffic Control.
  - Identify work zone traffic control supervisor and other appropriate persons to report issues to when they arise.
  - Emphasize that work zone traffic control devices must be in clean and in undamaged condition. If devices have been hit but not damaged, put back in their correct place and report to traffic control supervisor. If devices have been damaged, replace with new one and report to traffic control supervisor. If devices are dirty, faded or have missing or damaged reflective tape clean or replace and report to traffic control supervisor. Show examples of non-acceptable device conditions. Discuss various types of traffic control devices to be used and where spacing requirements can be found.
  - **Channelizing Devices and Barricades with Slanted Stripes.** Stripes are to slant in the direction you want traffic to stay or move to; demonstrate this with a device.
  - **Traffic Queuing.** Workers must be made aware of traffic queuing and the dangers created by it. Workers must be instructed to immediately notify the traffic control supervisor and other supervisory personnel if traffic is queuing beyond advance warning sign and devices or construction limits.
  - **Signs.** Signs must be straight and not leaning. Report problems to the traffic control supervisor or other as designated for immediate repair. Covered signs must be fully covered. If covers are damaged or out of place, report to traffic control supervisor or other as designated.

Special Provision to Item 7
Legal Relations and Responsibilities

Item 7, "Legal Relations and Responsibilities" 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 7.20., "Security Incidents," is added**.**

20.1. **Reporting of Security Incidents.** Immediately notify the Department's Cyber Security Operations Center (CSOC) via the Report Cybersecurity Incident Page on www.txdot.gov, of any potential cybersecurity incident or breach involving Department data**.** A breach of system security is the unauthorized acquisition of computerized data that compromises the security, confidentiality, or integrity of sensitive personal information maintained by a person, including data that is encrypted if the person accessing the data has the key required to decrypt the data.

20.2. **Liability for costs incurred.** The Department reserves the right to hold the Contractor liable for all costs incurred by the Department to resolve a security incident introduced by the Contractor, their Subcontractors, or their Suppliers.

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.

This item is supplemented by the following:

9. **Incentive Using Road-User Cost or Contract Administration Liquidated Damage Values and Disincentive Using Road-User Cost.** This special provision is for the application of incentives and disincentives as follows:

- incentives for early Contract completion using contract administration liquidated damage or substantial completion of work ahead of time using daily road-user cost values as basis and
- disincentives for late substantial completion of work using daily road-user costs.

Incentive provisions, based on contract administration liquidated damages, will apply when shown on the plans. Incentive provisions, based on road-user cost, will apply when shown on the plans. Disincentive provisions, based on road-user cost, will apply when road-user cost incentive provisions are shown on the plans. The disincentive provisions, based on road-user cost, will also apply when shown separately on the plans (without an associated road-user cost incentive). Definitions are as follows:

- Contract Completion - The final acceptance date (day) unless performance, establishment and maintenance periods occur. In the case of performance, establishment and maintenance periods, completion shall be considered when all work is complete and accepted except for performance, establishment and maintenance periods, with time computed to the suspension of time charges for the acceptance process.
- Substantial Completion of Work - The date (day) when all project work (or the work for a specified milestone or phase) requiring lane or shoulder closures or obstructions is completed, and traffic is following the lane arrangement as shown on the plans for the finished roadway (or the specified milestone or phase of work); all pavement construction and resurfacing are complete; and traffic control devices and pavement markings are in their final position (or as called for on the plans for the specified milestone of work). The Engineer may make an exception for permanent pavement markings provided the lack of markings does not cause a disruption to traffic flow or an unsafe condition for the traveling public, and work zone pavement markings are in place.

When A + B Bidding provisions are included in the Contract, the B working days bid will be considered as the time allowed for completion, contract or substantial as applicable. In addition, the plans will show either the number of working days or a specific date for the purposes of computing substantial completion incentives or disincentives.

Time charge adjustments will be made in accordance with the schedule required to meet Article 8.1, "Prosecution of Work" and Article 8.5, "Project Schedules," the proposal, and the plans. For Contracts with milestone dates, time charges for the completion incentives and disincentives will not be adjusted for weather, weekends, holidays, or other unforeseeable events not under the control or responsibility of the Department. However, time charges for completion incentives or disincentives may be adjusted by the Engineer when;

- work, under the control of the Department, such as extension of limits or changes in scope, change the actual duration of completion,

- delays occur due to unadjusted utilities or unclear right-or-way when clearance is not the responsibility of the Contractor, or
- catastrophic events occur, such as a declared state of emergency or natural disaster, if the event directly affects the Contractor's prosecution.

9.1. **Incentives.** When shown on the plans and in accordance with the Contract, the Department will pay an incentive for the early Contract completion or substantial completion of work under the number of working days stipulated in the Contract. The maximum number of working days used in computing the credit will be 30 days for each milestone and Contract completion incentive unless otherwise shown in the Contract. The amount of the credit will be added to money due or to become due to the Contractor.

9.1.1. **Early Contract Completion Incentive.** The incentive will be based on the difference between the actual early Contract completion days and the Contract completion days in the Contract. The difference will then be multiplied by the daily contract administration liquidated damage value shown in the proposal.

9.1.2. **Early Substantial Completion of Work Incentive.** The incentive will be based on the differences between the actual early substantial completion of work and the Contract days allowed to substantially complete the work (or the specified milestone or phase of work). The difference will then be multiplied by the daily road-user cost values specified for substantial Contract completion (or road-user cost specified for the corresponding milestone or phase of work).

9.2. **Disincentives for Failure to Substantially Complete Work on Time.** When shown on the plans and in accordance with the Contract, failure to substantially complete the work (or specified milestone or phase of work) within the established number of working days will result in the assessment of disincentives using the daily road-user cost shown on the plans for each working day in excess of those allowed. The road-user cost disincentive deductions will be in addition to any Contract administration liquidated damages, in accordance with Article 8.6, "Failure to Complete Work on Time." The amount of the disincentive will be deducted from money due or to become due to the Contractor. The road-user cost disincentives will be assessed not as a penalty, but for added expense incurred by the traveling public.

Special Provision to Item 8
Prosecution and Progress

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

Article 8.2., "Subcontracting," is supplemented by the following paragraph, which is added as paragraph six to this article:

The Contractor certifies by signing the Contract that the Contractor will not enter into any subcontract with a subcontractor that is not registered in the Department of Homeland Security's (DHS) E-Verify system. Require that all subcontractors working on the project register and require that all subcontractors remain active in the DHS E-Verify system until their work is complete on the project.

Special Provision to Item 8
Prosecution and Progress

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

Article 8.7.2., "Wrongful Default," is revised and replaced by the following:

If it is determined after the Contractor is declared in default, that the Contractor was not in default, the rights and obligations of all parties will be the same as if termination had been issued for the convenience of the public as provided in Article 8.8 "Termination of Contract."

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 8.6., "Failure to Complete Work on Time," is supplemented by the following:

8.6.1. Lane Closure Assessment Fees.

Monetary assessment, as shown on the plans, will be made against the Contractor for any lane closure or obstruction that overlaps into the peak hour traffic for each time increment defined on the plans or portion thereof, per lane, regardless of the length of lane closure or obstruction.

8.6.1.1. Definition of Terms. For this Contract, the following definitions apply:

8.6.1.1.1. Time increment. Any continuous defined increment of time period or portion thereof for a period beginning at that point when lanes are closed or obstructed by the Contractor's operations.

8.6.1.1.2. Assessment Fee. The amount shown on the proposal for each defined time increment, representing the average cost of interference and inconvenience to the road user for each lane closed or obstructed during peak hour traffic. The Engineer may allow a proportional fee assessment for closures that do not involve an entire defined time increment.

8.6.1.1.3. Closure or Obstruction. When the Contractor's operations result in a reduced lane width of the travel way or shoulder less than that specified on the plan documents.

8.6.1.1.4. Peak Hour Traffic Times. Schedule of days and times described in the General Notes, when lane closures or obstructions are not allowed.

8.6.1.2. Fee Calculation and Collection. The assessment fee will be deducted from the amount due to the Contractor on the monthly construction estimate, and thus retained by the Department. The Engineer will determine the time of overlap of lane closures or obstructions for calculating the assessment fee. The assessment fee is based on road user costs and is assessed not as a penalty, but for added expense incurred by the traveling public.

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 3., "Computation of Contract Time for Completion." The second paragraph is voided and replaced by the following:

The development of the conceptual time determination is intended to establish the number of working days on the Contract. Upon request, the Engineer will provide the conceptual time determination schedule to the Contractor for informational purposes only. The schedule assumes generic resources, production rates, sequences of construction, and average weather conditions based on historic data. Schedule labor, equipment, procurement of materials, subcontractor work, and all other necessary means to prosecute the work within the number of working days specified by the Contract.

Special Provision to Item 009
Measurement and Payment

Item 009 "Measurement and Payment" 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 9.5., "PROGRESS PAYMENTS" is supplemented with the following:

It is the Department's desire to pay a Contractor for work through the last working day of the month; however, the use of early cut-off dates for monthly estimates and MOH is a project management practice to manage workload at the Area Office level. Approval for using early cut-off dates is at the District's discretion. The earliest cut-off date for estimates is the 25th of the month.

Article 9.6., "PAYMENT FOR MATERIAL ON HAND (MOH)" first paragraph is amended as follows:

If payment for MOH is desired, request compensation for the invoice cost of acceptable nonperishable materials that have not been used in the work before the request, and that have been delivered to the work location or are in acceptable storage places. Nonperishable materials are those that do not have a shelf life or whose characteristics do not materially change when exposed to the elements. Include only materials that have been sampled, tested, approved, or certified, and are ready for incorporation into the work. Only materials which are completely constructed or fabricated on the Contractor's order for a specific Contract and are so marked and on which an approved test report has been issued are eligible. Payment for MOH may include the following types of items: concrete traffic barrier, precast concrete box culverts, concrete piling, reinforced concrete pipe, and illumination poles. Any repairs required after fabricated materials have been approved for storage will require approval of the Engineer before being made and will be made at the Contractor's expense. Include only those materials and products, when cumulated under an individual item or similar bid items, that have an invoice cost of at least $1,000 in the request for MOH payment (e.g. For MOH eligibility, various sizes of conductor are considered similar bid items and may be cumulated to meet the threshold; for small roadside signs, the sign supports, mounting bolts, and the sign face is considered one bid item or similar bid items for more than one pay item for sign supports.) Requests for MOH are to be submitted at least two days before but not later than the estimate cutoff date unless otherwise agreed. If there is a need to request MOH after the established cut-off date, the district can make accommodation as the need arises. This needed accommodation is to be the exception, though, and not the rule.

Special Provision to Item 9
Measurement and Payment

Item 9, "Measurement and Payment" 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.

Section 9.7.1.4.3., "Standby Equipment Costs," is voided and replaced by the following:

7.1.4.3. **Standby Equipment Costs.** Payment for standby equipment will be made in accordance with Section 9.7.1.4., "Equipment," except that the 15% markup will not be allowed and that:

Section 7.1.4.3.1., "Contractor-Owned Equipment," is voided and replaced by the following:

7.1.4.3.1. **Contractor-Owned Equipment**. For Contractor-owned equipment:

- Standby will be paid at 50% of the monthly Equipment Watch rate after the regional and age adjustment factors have been applied. Operating costs will not be allowed. Calculate the standby rate as follows.

  Standby rate = (FHWA hourly rate - operating costs) × 50%

- If an hourly rate is needed, divide the monthly *Equipment Watch* rate by 176.
- No more than 8 hr. of standby will be paid during a 24-hr. day period, nor more than 40 hr. per week.
- Standby costs will not be allowed during periods when the equipment would have otherwise been idle.

Special Provision to Item 132
Embankment

Item 132, "Embankment" 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 132.3.4., "Compaction Methods." The last sentence is replaced by the following.

Compact embankments in accordance with Section 132.3.4.1., "Ordinary Compaction," or Section 132.3.4.2., "Density Control," as shown on the plans. The Contractor may use Section 132.3.4.3., "Density Control by Computer-Generated (CG) Curve," as an option for density control.

Article 132.3.4., "Compaction Methods," is supplemented by the following.

3.4.3. **Density Control by Computer-Generated (CG) Curve.** At the Contractor's discretion, CG curves may be used for density control.

Compact each layer to the required density using equipment complying with Item 210, "Rolling." Determine the maximum lift thickness based on the ability of the compacting operation and equipment to meet the required density. Do not exceed layer thickness of 12 in. loose or 10 in. compacted material, unless otherwise approved. Maintain a level layer with consistent thickness to ensure uniform compaction.

When using this method for each source and type of material, or when directed, sample and conduct testing according to the input parameters specified in Table 3 and provide CG field moisture-density curves based on each soil-compactor-lift thickness combination and CG Tex-114-E moisture-density curves based on each lift of soil. The CG field dry density (D_{fcg}) must be greater than or equal to the CG Tex-114-E maximum dry density (D_{acg}). The Engineer may obtain independent soil samples for supplemental Tex-114-E lab tests to check a supplemental maximum dry density (D_a) and optimum moisture content (W_{opt}) for reference when new CG curves are submitted. Provide access to the computer program used to generate the curve, when directed.

Table 3
Computer-Generated Lab and Field Compaction Curve Input Criteria

Input Variables	Test Method
Liquid Limit, %	Tex-104-E
Plasticity Index (PI), %	Tex-106-E
Soil gradation	Tex-110-E Tex-111-E
Soil classification	Tex-112-E
Compaction roller brand, type, and model	N/A
Loose lift thickness, in.	N/A
Soil specific gravity	Use 2.65 for soil type SC. Use 2.68 for soil type CL. Use 2.69 for soil type CH.

Provide a compaction control report showing all input and output parameters and CG compaction curves, including:

- CG Tex-114-E laboratory maximum dry density (D_{acg}),
- CG Tex-114-E laboratory optimum moisture content (W_{optcg}),
- CG field maximum dry density (D_{fcg}),

- CG field optimum moisture content (Wf_{optcg}),
- graph of CG laboratory and field compaction curves and the "Zero Air Voids Line," and
- minimum number of roller passes to achieve the required density and moisture content.

Meet the requirements for field maximum dry density (D_{fcg}) and field optimum moisture content (Wf_{optcg}) specified in Table 4, unless otherwise shown on the plans. Use only the specific roller and soil properties utilized in lift construction as input parameters to generate the CG field curve used to meet moisture-density requirements in construction.

Table 4
Computer-Generated Lab and Field Compaction Curve Input Criteria

Description	Density	Moisture Content
	Tex-115-E	
PI ≤ 15	≥ 98% D_{fcg}	≥ Wf_{optcg}
15 < PI ≤ 35	≥ 98% D_{fcg} and ≤ 102% D_{fcg}	≥ Wf_{optcg}
PI > 35	≥ 95% D_{acg} and ≤ 100% D_{acg}	≥ Wf_{optcg}

Each layer is subject to testing by the Engineer for density and moisture content. During compaction, the moisture content of the soil should be above CG optimum moisture content but should not exceed the value shown on the moisture-density curve, above optimum, required to achieve 98% dry density.

When the CG field maximum dry density (D_{fcg}) is not achieved, perform the following steps in order.

- Verify that construction controls including lift soil properties, minimum number and uniformity of compactor passes, lift thickness, and moisture content are correct.
- If needed, rework the lift with the corrected controls using the original CG curve.
- Generate a new CG field compaction curve based on actual in-place soil properties and rework the lift.
- Generate a non-CG Tex-114-E moisture-density reference standard and rework the material using this reference standard.

When required, remove small areas of the layer to allow for density tests. Replace the removed material and recompact at no additional expense to the Department. Proof-roll in accordance with Item 216, "Proof Rolling," when shown on the plans or as directed. Correct soft spots as directed.

Article 132.3.5., "Maintenance of Moisture and Reworking." The first sentence is replaced by the following.

Maintain the density and moisture content once all requirements in Table 2 or 4 are met.

Special Provision to Item 247
Flexible Base

Item 247, "Flexible Base," 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.

Section 247.2.1., "Aggregate." This Section is voided and replaced by the following.

Furnish aggregate of the type and grade shown on the plans and meeting the requirements shown in Table 1. Each source must meet Table 1 requirements for liquid limit, plasticity index, and wet ball mill for the grade specified. Do not use additives, such as but not limited to cement, emulsion, foamed asphalt, or lime, to modify aggregates to meet the requirements of Table 1, unless otherwise shown on the plans.

Unless otherwise shown on the plans, the unconfined compressive strength is waived when the flexible base material meets the #200 sieve requirement.

Table 1
Material Requirements

Property	Test Method	Grade 1–2[3]	Grade 3	Grade 4	Grade 5[3]
Master gradation sieve size (cumulative % retained)	Tex-110-E	–	–	As shown on the plans	–
2-1/2"		0	0		0
1-3/4"		0–10	0–10		0–5
7/8"		10–35	–		10–35
3/8"		30–65	–		35–65
#4		45–75	45–75		45–75
#40		65–90	50–85		70–90
#200[1, 2]		85–95	–		–
Liquid limit, % Max	Tex-104-E	40	40		35
Plasticity index, Max	Tex-106-E	10	12		10
Plasticity index, Min		As shown on the plans	As shown on the plans		As shown on the plans
Wet ball mill, % Max	Tex-116-E	40	–		40
Wet ball mill, % Max increase passing the #40 sieve		20	–		20
Min compressive strength[2], psi	Tex-117-E	–	–		–
lateral pressure 0 psi		35	–		–
lateral pressure 3 psi		–	–		90
lateral pressure 15 psi		175	–		175

1. The #200 sieve test is only required to meet the waiver of the unconfined compressive strength. The #200 sieve test requirement is only applicable to stockpile samples from Section 247.2.4.
2. Compressive strength and #200 sieve test requirements are waived when the flexible base is mixed with or without existing material and treated with cement, emulsion, foamed asphalt, or lime, unless otherwise shown on the plans.
3. Grade 3 may be substituted for Grade 1–2 or Grade 5 when the flexible base is mixed with or without existing material and treated with cement, emulsion, foamed asphalt, or lime, as approved. The Grade 3 flexible base must meet the wet ball mill requirements of Grade 1–2 or Grade 5.

Section 247.2.1.2.4., "Type D." The third sentence is voided and replaced by the following.

Crushed concrete must meet the requirements in Section 247.2.1.3., "Recycled Material," and be managed in a way to provide for uniform quality.

Section 247.2.1.3., "Recycled Material." This Section is voided and replaced by the following.

Reclaimed asphalt pavement (RAP) and other recycled materials may be used as shown on the plans. Request approval to blend two or more sources of recycled materials. When RAP is allowed, do not exceed 20% RAP by weight, unless otherwise shown on the plans. The percentage limitations for other recycled materials are as shown on the plans.

Provide recycled materials, other than RAP, that have a maximum sulfate content of 3,000 ppm when tested in accordance with Tex-145-E. Certify accordance with DMS-11000, "Evaluating and Using Nonhazardous Recyclable Materials Guidelines." In addition, recycled materials must be free of reinforcing steel and other objectionable material and have at most 1.5% deleterious material when tested in accordance with Tex-413-A. The liquid limit, plasticity index, wet ball mill, and compressive strength for all recycled materials are waived. When using RAP, crush RAP so that 100% passes the 2-in. sieve and does not exceed a maximum percent loss from decantation of 5.0% when tested in accordance with Tex-406-A. Test RAP without removing the asphalt. The final product must meet the requirements shown in Table 1 for the grade specified, except when the Department requires a specific amount of Department-furnished RAP be added to the blend, unless otherwise shown on the plans.

The Contractor is responsible for uniformly blending the recycled material with the flexible base material to build a stockpile to meet the percentages required. Any Contractor-furnished surplus of recycled materials must remain the property of the Contractor. Remove Contractor-owned recycled materials from the project, and dispose of them in conformance with federal, state, and local regulations before project acceptance.

Section 247.2.4., "Stockpile Approval." This Section is added.

Stockpile is approved when the Engineer's test results meet the material requirements shown in Table 1.

Section 247.2.4.1., "Sampling." This Section is added.

The Contractor and the Engineer will sample flexible base from completed stockpiles in accordance with Tex-100-A. Personnel conducting sampling must be certified by the Department-approved soils and base certification program.

Sampling stockpiles may be located at the production site or at the project location. The Contractor must witness the Engineer's sampling and sample the stockpile for their own testing, and label as deemed necessary.

Sample the stockpile for the Engineer as shown on the plans. When the Contractor samples the stockpile for the Engineer, the Engineer will witness the sampling of material designated for the Engineer and the Materials and Tests Division (MTD). The Engineer will label their sampling containers as "Engineer" and "MTD," or as deemed necessary.

The Engineer will take immediate possession of the sample containers for the Engineer and MTD. The Engineer will maintain custody of the samples until all testing and reporting are completed.

Section 247.2.4.2., "Referee Testing." This Section is added.

Referee testing is applicable for stockpile testing only. MTD is the referee laboratory. MTD may designate a laboratory from the Department's MPL for *Commercial Laboratories Approved for Flexible Base Referee Requests* as the referee laboratory as deemed necessary. The designated laboratory must not perform any testing under this Item for the Engineer or Contractor.

The Contractor may request referee testing when the Engineer's test results fail to meet any of the material requirements shown in Table 1 and when the Contractor's sample from Section 247.2.4.1., "Sampling," for the same failing Department test passes. The tests must be performed by a laboratory on the Department's MPL for *Commercial Laboratories Approved for Flexible Base Referee Requests*. Submit the request by email within 5 working days after receiving failing test results from the Engineer. Include completed test reports passing the applicable requirements shown in Table 1 in the email.

Record and submit completed test reports electronically on Department-provided templates in their original format meeting the applicable material requirements shown in Table 1. Use Department-provided templates to record and calculate all test data. The Engineer and the Contractor will provide any available test results to the other party when requested.

Section 247.4.3., "Compaction." The first paragraph is voided and replaced by the following.

Compact using density control unless otherwise shown on the plans. Multiple lifts are permitted as shown on the plans or approved. Bring each layer to the moisture content directed. When necessary, sprinkle the material in accordance with Item 204, "Sprinkling." Maintain moisture during compaction within ±2.0% of the optimum moisture content as determined in accordance with Tex-113-E.

Section 247.4.3.2., "Density Control." This Section is voided and replaced by the following.

Compact to at least 100% of the maximum dry density and within ±2.0% of the optimum moisture content as determined in accordance with Tex-113-E, unless otherwise shown on the plans. Provide the Engineer with the beginning and ending station numbers of the area completed for testing. The Engineer will determine roadway density and moisture content of completed sections in accordance with Tex-115-E, Part I. The Engineer will determine random locations for testing in accordance with Tex-115-E, Part IV. Do not achieve density by drying the material after compaction.

When the density is less than 100% of the maximum dry density, the Engineer may perform additional testing to determine the extent of the area to correct. The Engineer may accept the section if no more than one of the five most recent density tests is below the specified density and the failing test is no more than 3 pcf below the specified density.

Section 247.4.3.3., "Miscellaneous and Small Areas." This Section is added.

Miscellaneous areas are those that typically involve handwork or discontinuous paving operations, such as temporary detours, driveways, mailbox turnouts, crossovers, gores, spot level-up areas, and other similar areas. Miscellaneous and small areas are not subject to random sampling procedure but may be tested as directed.

Section 247.4.6., "Ride Quality." This Section is voided and replaced by the following.

Measurement of ride quality only applies to the final travel lanes that receive a one- or two-course surface treatment for the final riding surface, unless otherwise shown on the plans. Measure the ride quality of the base course either before or after the application of the prime coat, as directed, and before placement of the surface treatment. Use a certified profiler operator on the Department's MPL. When requested, furnish the Engineer with documentation for the person certified to operate the profiler.

Provide all profile data to the Engineer in electronic data files within 3 days of measuring the ride quality using the format specified in Tex-1001-S. The Engineer will use Department software to evaluate longitudinal profiles to determine areas requiring corrective action. Correct 0.1-mi. sections with an average international roughness index (IRI) value greater than 100 in. per mile to an IRI value of 100 in. per mile or less, unless otherwise shown on the plans. Re-profile and correct sections that fail to maintain ride quality before the placement of the surface treatment, as directed. Unless ride deterioration is due to environmental impact, traffic, or other incidents outside the Contractor's control, perform this work at no additional expense to the Department, as approved.

Special Provision to Item 300
Asphalt, Oils, and Emulsions

Item 300, “Asphalt, Oils, and Emulsions” of the Standard Specifications is replaced by Special Specification 3096, “Asphalts, Oils, and Emulsions.” All Item 300 Special Provisions are no longer available, beginning with the April 2022 letting.

Special Provision to Item 302
Aggregates for Surface Treatments

Item 302, "Aggregates for Seal Coats," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 2.1., "Aggregate." Tables 2 and 3 are voided and replaced by the following.

Table 2
Aggregate Gradation Requirements (Cumulative % Retained[1])

Sieve	Grade								
	1	2	3S[2]	3		4S[2]	4	5S[2]	5
				Non-Lightweight	Lightweight				
1"	-	-	-	-	-	-	-	-	-
7/8"	0–2	0	-	-	-	-	-	-	-
3/4"	20–35	0–2	0	0	0	-	-	-	-
5/8"	85–100	20–40	0–5	0–5	0–2	0	0	-	-
1/2"	-	80–100	55–85	20–40	10–25	0–5	0–5	0	0
3/8"	95–100	95–100	95–100	80–100	60–80	60–85	20–40	0–5	0–5
1/4"	-	-	-	95–100	95–100	-	-	65–85	-
#4	-	-	-	-	-	95–100	95–100	95–100	50–80
#8	99–100	99–100	99–100	98–100	98–100	98–100	98–100	98–100	98–100

1. Round test results to the nearest whole number.
2. Single-size gradation.

Table 3
Aggregate Quality Requirements

Property	Test Method	Requirement[1]	
		Minimum	Maximum
SAC	AQMP	As shown on the plans	
Deleterious Material[2], %	Tex-217-F, Part I	-	2.0
Decantation, %	Tex-406-A	-	1.5
Flakiness Index, %	Tex-224-F	-	17
Gradation	Tex-200-F, Part I	Table 2 Requirements	
Los Angeles Abrasion, %	Tex-410-A	-	35
Magnesium Sulfate Soundness, 5 Cycle, %	Tex-411-A	-	25
Micro-Deval Abrasion, %	Tex-461-A	Note 3	
Coarse Aggregate Angularity[4], 2 Crushed Faces, %	Tex-460-A, Part I	85	-
Additional Requirements for Lightweight Aggregate			
Dry Loose Unit Wt., lb./cu. ft.	Tex-404-A	35	60
Pressure Slaking, %	Tex-431-A	-	6.0
Freeze-Thaw Loss, %	Tex-432-A	-	10.0
Water Absorption, 24hr., %	Tex-433-A	-	12.0

1. Material requirements are listed below, unless otherwise shown on the plans.
2. Not required for lightweight aggregate.
3. Used to estimate the magnesium sulfate soundness loss in accordance with Section 2.1.1.
4. Only required for crushed gravel.

Section 2.1.1., "Micro-Deval Abrasion," is added.

The Engineer will perform a minimum of one Micro-Deval abrasion test in accordance with Tex-461-A for each coarse aggregate source per project that has a Rated Source Soundness Magnesium (RSSM) loss value greater than 15 as listed in the BRSQC. The Engineer may waive all Micro-Deval testing based on a satisfactory test history of the same aggregate source.

The Engineer will estimate the magnesium sulfate soundness loss for each coarse aggregate source, when tested, using the following formula.

$Mg_{est.} = (RSSM)(MD_{act.}/RSMD)$

where:
$Mg_{est.}$ = magnesium sulfate soundness loss
$MD_{act.}$ = actual Micro-Deval percent loss
RSMD = Rated Source Micro-Deval

When the estimated magnesium sulfate soundness loss is greater than the maximum magnesium sulfate soundness loss specified, the coarse aggregate source will not be allowed for use unless otherwise approved by the Engineer. The Engineer may require additional testing before granting approval.

Section 2.2., "Precoating." The third paragraph is voided and replaced by the following.

The Engineer retains the right to remove precoat material from aggregate samples in accordance with Tex-210-F, or as recommended by the Construction Division, and test the aggregate to verify compliance with Table 2 and Table 3 requirements. Gradation testing may be performed with precoat intact.

Section 2.3., "Sampling," is added.

Personnel who conduct sampling and witnessing of sampling must be certified by the Department-approved certification program. Supply the Engineer with a list of certified personnel and copies of their current certificates before beginning construction and when personnel changes are made. At any time during the project, the Engineer may perform production tests as deemed necessary in accordance with Item 5, "Control of the Work."

The Engineer will sample aggregate from stockpiles located at the production site, intermediate distribution site, or project location in accordance with Tex-221-F, Section 3.2.3. The Engineer will split each sample into 2 equal portions in accordance with Tex-200-F, Section 3.3, and label these portions "Engineer" and "Contractor" or "Supplier." Witness the sampling and splitting, and take immediate possession of the samples labeled "Contractor" or "Supplier".

Section 2.4., "Reporting and Responsibilities," is added.

The Engineer will provide test results to the Contractor and Supplier within 10 working days from the date the stockpile was sampled for sources listed on the Department's Bituminous Rated Source Quality Catalog (BRSQC), unless otherwise directed. The Engineer will provide test results for the LA Abrasion (Tex-410-A) and Magnesium Sulfate Soundness (Tex-411-A) tests within 30 calendar days for sources not listed on the BRSQC, or for sources not meeting the requirements of Section 2.1.1., "Micro-Deval Abrasion." The Engineer will report to the other party within 24 hours when any test result does not meet the requirements listed in Table 2 or Table 3.

Special Provision to Item 316
Seal Coat

Item 316, "Seal Coat" 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.

Section 4.8, "Asphalt Placement" is supplemented by the following:

4.8.5. Collect all samples in accordance with Tex-500-C, "Sampling Bituminous Materials, Pre-Molded Joint Fillers, and Joint Sealers" from the distributor and with witness by the Engineer.

At least once per project, collect split samples of each binder grade and source used. The Engineer will submit one split sample to MTD for testing and retain the other split sample.

In addition, collect one sample of each binder grade and source used on the project for each production day. The Engineer will retain these samples.

The Engineer will keep all retained samples for one yr., for hot-applied binders and cutback asphalts; or for two mo., for emulsified asphalts. The Engineer may submit retained samples to MTD for testing as necessary or as requested by MTD.

Special Provision to Item 360
Concrete Pavement

Item 360, "Concrete Pavement" 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.

Section 360.2.1., "Materials," the third paragraph is voided and replaced by the following:

For continuously reinforced concrete pavements, use a coarse aggregate with a rated coefficient of thermal expansion of not more than 5.5×10^{-6} in./in./°F as listed in the Department's *Concrete Rated Source Quality Catalog*.

Section 360.4.8.3., "Surface Texture," the second paragraph is voided and replaced by the following:

A metal-tine texture finish is required unless otherwise shown on the plans. Provide transverse or longitudinal tining unless otherwise shown on the plans. Immediately following the carpet drag, apply a single coat of evaporation retardant, if needed, at the rate recommended by the manufacturer. Provide the metal-tine finish immediately after the concrete surface has set enough for consistent tining. Operate the metal-tine device to obtain grooves approximately 3/16 in. deep, with a minimum depth of 1/8 in., and approximately 1/12 in. wide. Do not overlap a previously tined area. Use manual methods to achieve similar results on ramps, small or irregular areas, and narrow width sections of pavements. Repair damage to the edge of the slab and joints immediately after texturing. Do not tine pavement that will be overlaid or that is scheduled for blanket diamond grinding or shot blasting.

Special Provision to Item 420
Concrete Substructure

Item 420, “Concrete Substructures” of the Standard Specifications is amended with respect to the clause cited below. No other clauses or requirements of this Item are waived or changed.

Article 420.6., “Payment.” The first paragraph is replaced by the following:

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 the class of concrete and element identified and by the special designation when appropriate. This price is full compensation for furnishing, hauling, and mixing concrete materials; furnishing, bending, fabricating, splicing, welding and placing the required reinforcement; clips, blocks, metal spacers, ties, wire, or other materials used for fastening reinforcement in place; placing, finishing, and curing concrete; mass placement controls; applying ordinary surface finish; furnishing and placing drains, metal flashing strips, and expansion-joint material; excavation, subgrade preparation; and forms and falsework, equipment, labor, tools, and incidentals.

Special Provision to Item 421
Hydraulic Cement Concrete

Item 421, "Hydraulic Cement Concrete" 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 421.2., "Materials," the second sentence of the first paragraph is voided and replaced by the following.

Provide aggregates from sources listed in the Department's Concrete Rated Source Quality Catalog (CRSQC).

Article 421.2.2., Supplementary Cementing Materials (SCM), is voided and replaced with the following.

Supplementary Cementitious Materials (SCM).

- **Coal Ash**. Furnish sources of fly ash, , Modified fly ash (MFA), harvested coal ash, and Ground Bottom Ash (GBA) conforming to DMS-4610, "Coal Ash."
- **Slag Cement**. Furnish Slag Cement in accordance with DMS-4620, "Slag Cement."
- **Silica Fume**. Furnish silica fume in accordance with DMS-4630, "Silica Fume."
- **Natural Pozzolans**. Furnish Natural Pozzolans in accordance with DMS-4635, "Natural Pozzolans."

Article 421.3.1.3., "Agitators and Truck and Stationary Mixers," the first paragraph is voided and replaced by the following.

Provide stationary and truck mixers capable of combining the ingredients of the concrete into a thoroughly mixed and uniform mass and capable of discharging the concrete so that the requirements of Tex-472-A are met.

Article 421.3.1.3., "Agitators and Truck and Stationary Mixers," is supplemented with the following.

Truck mixers with automated water and chemical admixture measurement and slump and slump flow monitoring equipment meeting the requirement of ASTM C94 will be allowed. Provide data every 6 mo. substantiating the accuracy of slump, slump flow, temperature, water, and chemical admixture measurements. The slump measured by the automated system must be within 1 in. of the slump measured in accordance with Tex-415-A. The concrete temperature measured by the automated system must be within 1°F of concrete temperature measured in accordance with Tex-422-A. The Engineer will not use the automated measurements for acceptance.

Article 421.4.2., "Mix Design Proportioning," Table 8 is voided and replaced by the following.

Table 8
Concrete Classes

Class of Concrete	Design Strength,[1] Min f'_c (psi)	Max w/cm Ratio	Coarse Aggregate Grades[2,3,4]	Cement Types	Mix Design Options	Exceptions to Mix Design Options	General Usage[5]
A	3,000	0.60	1–4, 8	I, II, I/II, IL, IP, IS, IT, V	1, 2, 4, & 7	When the cementitious material content does not exceed 520 lb./cu. yd., any coal ash or natural pozzolan listed in the MPL may be used at a cement replacement of 20% to 50%.	Curb, gutter, curb & gutter, conc. retards, sidewalks, driveways, back-up walls, anchors, non-reinforced drilled shafts
B	2,000	0.60	2–7				Riprap, traffic signal controller foundations, small roadside signs, and anchors
C[6]	3,600	0.45	1–6	I, II, I/II, IP, IL, IS, IT, V	1–8		Drilled shafts, bridge substructure, traffic rail, culverts except top slab of direct traffic culverts, headwalls, wing walls, inlets, manholes, traffic barrier
E	3,000	0.50	2–5	I, II, I/II, IL, IP, IS, IT, V	1–8	When the cementitious material content does not exceed 520 lb./cu. yd., any coal ash or natural pozzolan listed in the MPL may be used at a cement replacement of 20% to 50%.	Seal concrete
F[6]	Note[7]	0.45	2–5	I, II, I/II, IP, IL, IS, IT, V			Railroad structures; occasionally for bridge piers, columns, bents, post-tension members
H[6]	Note[7]	0.45	3–6	I, II, I/II, III, IP, IL, IS, IT, V	1–4, 8	Mix design options 1-8 allowed for cast-in-place concrete and the following precast elements unless otherwise stated in the plans: ■ Bridge Deck Panels, ■ Retaining Wall Systems, ■ Coping, ■ Sound Walls, ■ Wall Columns, ■ Traffic Rail, ■ Traffic Barrier, ■ Long/Arch Span Culverts, and ■ precast concrete products included in Item 462, "Concrete Box Culverts and Drains, Item 464, "Reinforced Concrete Pipe," and Item 465, "Junction Boxes, Manholes, and Inlets." Do not use Type III cement in mass placement concrete. Up to 20% of blended cement may be replaced with listed SCMs when Option 4 is used for precast concrete. Options 6, & 7 allowed for cast-in-place Class H concrete.	Precast concrete, post-tension members
S[6]	4,000	0.45	2–5	I, II, I/II, IP, IL, IS, IT, V	1–8		Bridge slabs, top slabs of direct traffic culverts, approach slabs

Class of Concrete	Design Strength,[1] Min f'_c (psi)	Max w/cm Ratio	Coarse Aggregate Grades[2,3,4]	Cement Types	Mix Design Options	Exceptions to Mix Design Options	General Usage[5]
P	See Item 360, "Concrete Pavement."	0.50	2–3	I, II, I/II, IL, IP, IS, IT, V	1–8	When the cementitious material content does not exceed 520 lb./cu. yd., any coal ash or natural pozzolan listed in the MPL's may be used at a cement replacement of 20% to 50%.	Concrete pavement
CO[6]	4,600	0.40	6	I, II, I/II, IP, IL, IS, IT, V	1–8		Bridge deck concrete overlay
LMC[6]	4,000	0.40	6–8				Latex-modified concrete overlay
SS[6]	3,600	0.45	4–6		1-8	Use a Min cementitious material content of 658 lb./cu. yd. of concrete. Limit the alkali loading to 4.0 lbs./cu. yd. or less when using Option 7.	Slurry displacement shafts, underwater drilled shafts
K[6]	Note[7]	0.40	Note[7]	I, II, I/II, III IP, IL, IS, IT, V	1-8		Note[7]
HES	Note[7]	0.45	Note[7]	I, IL, II, I/II, III		Mix design options do not apply. 700 lb. of cementitious material per cubic yard limit does not apply.	Concrete pavement, concrete pavement repair
"X" (HPC) [6,8,9]	Note[10]	0.45	Note[10]	I, II, I/II, III IP, IL, IS, IT, V	1–4, & 8	Max coal ash replacement for Option 3 may be increased to 50%. Up to 20% of a blended cement may be replaced with listed SCMs for Option 4. Do not use Option 8 for precast concrete.	
"X" (SRC) [6,8,9]	Note[10]	0.45	Note[10]	I/II, II, IP, IL (MS or HS), IS, IT (MS or HS), V	1–4, & 7	When using coal ash, only use coal ashes allowed for SRC as listed in the Coal Ash MPL. Type III-MS may be used where allowed. Type I, Type IL, and Type III cements may be used when natural pozzolans are used or when coal ashes allowed for SRC as listed in the Coal Ash MPL are used, and with a Max w/cm of 0.40. Up to 20% of blended cement may be replaced with listed SCMs when Option 4 is used for precast concrete. Use Option 7 for precast concrete where allowed.	

1. Design strength must be attained within 56 days.
2. Do not use Grade 1 coarse aggregate except in massive foundations with 4 in. Min clear spacing between reinforcing steel bars, unless otherwise permitted. Do not use Grade 1 aggregate in drilled shafts.
3. Use Grade 8 aggregate in extruded curbs unless otherwise approved.
4. Other grades of coarse aggregate maybe used in non-structural concrete classes when allowed by the Engineer.
5. For information only.
6. Structural concrete classes.
7. As shown on the plans or specified.
8. "X" denotes class of concrete shown on the plans or specified.
9. (HPC): High Performance Concrete, (SRC): Sulfate Resistant Concrete.
10. Same as class of concrete shown on the plans.

Article 421.4.2.2., "Aggregates," is supplemented by the following.

Use the following equation to determine if the aggregate combination meets the sand equivalency requirement when blending fine aggregate or using an intermediate aggregate:

$$\frac{(SE_1 \times P_1)+(SE_2 \times P_2)+(SE_{ia} \times P_{ia})}{100} \geq 80\%$$

where:
SE_1 = sand equivalency (%) of fine aggregate 1
SE_2 = sand equivalency (%) of fine aggregate 2
SE_{ia} = sand equivalency (%) of intermediate aggregate passing the 3/8 in. sieve
P_1 = percent by weight of fine aggregate 1 of the fine aggregate blend
P_2 = percent by weight of fine aggregate 2 of the fine aggregate blend
P_{ia} = percent by weight of intermediate aggregate passing the 3/8 in. sieve

Article 421.4.2.3., Chemical Admixtures," the second paragraph is voided and replaced with the following.

Use a 30% calcium nitrite solution when a corrosion-inhibiting admixture is required. Dose the admixture at the rate of gallons of admixture per cubic yard of concrete shown on the plans. Use set retarding admixtures, as needed, to control setting time to ensure concrete containing corrosion inhibiting admixtures remain workable for the entire duration of the concrete placement. Perform setting time testing and slump loss testing during trial batch testing.

Article 421.4.2.5., "Slump," the second paragraph is voided and not replaced. Table 9 is voided and replaced with below:

Table 9
Placement Slump Requirements

General Usage	Placement Slump Range,[1,2] in.
Walls (over 9 in. thick), caps, columns, piers	3 – 7
Bridge slabs, top slabs of direct traffic culverts, approach slabs, concrete overlays, latex-modified concrete for bridge deck overlays	3 – 6
Inlets, manholes, walls (less than 9 in. thick), bridge railing, culverts, concrete traffic barrier, concrete pavement (formed)	4 – 6
Precast concrete	4 – 9
Underwater concrete placements	6 – 8-1/2
Drilled shafts, slurry displaced and underwater drilled shafts	See Item 416, "Drilled Shaft Foundations."
Curb, gutter, curb and gutter, concrete retards, sidewalk, driveways, seal concrete, anchors, riprap, small roadside sign foundations, concrete pavement repair, concrete repair	As approved

1. Max slump values may be increase above these values shown using chemical admixtures, provided the admixture treated concrete has the same or lower water-to-cementitious ratio and does not exhibit segregation or excessive bleeding. Request approval to increase slump limits in advance for proper evaluation by the Engineer.
2. For fiber reinforced concrete, perform slump before addition of fibers.

Article 421.4.2.6., "Mix Design Options," is voided and replaced with the following.

Option 1. Replace cement with at least the minimum dosage listed in the MPL for the coal ash or natural pozzolan used in the mixture. Do not replace more than 50% of the cement. Conduct Option 8 testing as listed on the MPL.

Option 2. Replace 35% to 50% of the cement with slag cement.

Option 3. Replace 35% to 50% of the cement with a combination of coal ash, slag cement, natural pozzolan, or at least 3% silica fume; however, no more than 10% may be silica fume.

Option 4. Use Type IP, Type IS, or Type IT cement as allowed in Table 8 for each class of concrete. When replacing blended cements with additional SCM's, the replacement limits in Option 3 will apply to the final cementitious mixture. When using coal

ash or natural pozzolans not having a minimum dosage listed in the MPL in the final cementitious mixture, perform Option 8 testing.

Option 5. Option 5 is left intentionally blank.

Option 6. Use a lithium nitrate admixture at a minimum dosage determined by testing conducted in accordance with Tex-471-A. Before use of the mix, provide an annual certified test report signed and sealed by a licensed professional engineer, from a laboratory listed on the MPL, certified by the Materials and Tests Division as being capable of testing according to Tex-471-A.

Option 7. Ensure the total alkali contribution from the cement in the concrete does not exceed 3.5 lb. per cubic yard of concrete when using hydraulic cement not containing SCMs calculated as follows:

$$\text{lb. alkali per cu. yd.} = \frac{(\text{lb. cement per cu. yd.}) \times (\%\ Na_2O \text{ equivalent in cement})}{100}$$

In the above calculation, use the maximum cement alkali content reported on the cement mill certificate.

Option 8. Use Table 10 when deviating from Options 1–3 or when required by the Coal Ash MPL. Perform required testing annually and submit results to the Engineer. Laboratories performing ASTM C1260, ASTM C1567, and ASTM C1293 testing must be listed on the MPL. Before use of the mix, provide a certified test report signed and sealed by a licensed professional engineer demonstrating the proposed mixture in accordance with the requirements of Table 10.

Provide a certified test report signed and sealed by a licensed professional engineer, when HPC is required, and less than 20% of the cement is replaced with SCMs, demonstrating ASTM C1876 test results indicate the uniaxial resistivity of the concrete is greater than 15.6 kΩ-cm tested immediately after either of the following curing schedules:

- Moisture cure specimens 56 days at 73°F.
- Moisture cure specimens 7 days at 73°F followed by 21 days at 100°F.

Table 10
Option 8 Testing and Mix Design Requirements

Scenario	ASTM C1260 Result		Testing Requirements for Mix Design Materials or Prescriptive Mix Design Options
	Mix Design Fine Aggregate	Mix Design Coarse Aggregate	
A	> 0.10%	> 0.10%	Determine the dosage of SCMs needed to limit the 14-day expansion of each aggregate[1] to 0.10% when tested individually in accordance with ASTM C1567.
B	≤ 0.10%	≤ 0.10%	Use the Min replacement listed in the Coal Ash MPL, or when Option 8 is listed on the MPL, use a Min of 40% coal ash with a Max CaO[2] content of 25%, or use any ternary combination which replaces 35% to 50% of cement.
	≤ 0.10%	ASTM C1293 1 yr. Expansion ≤ 0.04%	Use a minimum of 20% of any coal ash; or Use any ternary combination which replaces 20% to 50% of cement.
C	≤ 0.10%	> 0.10%	Determine the dosage of SCMs needed to limit the 14-day expansion of coarse and intermediate[1] aggregate to ≤0.10% when tested individually in accordance with ASTM C1567.
D	> 0.10%	≤ 0.10%	Use the Min replacement listed in the Coal Ash MPL, or when Option 8 is listed on the MPL, use a Min of 40% coal ash with a Max CaO[2] content of 25%, or use any ternary combination which replaces 35% to 50% of cement.
	> 0.10%	ASTM C1293 1 yr. Expansion ≤ 0.04%	Determine the dosage of SCMs needed to limit the 14-day expansion of each fine aggregate to ≤0.10% when individually tested in accordance with ASTM C1567.

1. Intermediate size aggregates will fall under the requirements of mix design coarse aggregate.
2. Average the CaO content from the previous ten values as listed on the test certificate.

Article 421.4.2.7., "Optimized Aggregate Gradation (OAG) Concrete," the first sentence of the first paragraph is voided and replaced by the following.

The gradations requirements in Table 4 and Table 6 do not apply when OAG concrete is specified or used by the Contractor unless otherwise shown on the plans.

The fineness modulus for fine aggregate listed in Table 5, does not apply when OAG concrete is used,

Article 421.4.6.2., Delivering Concrete," the third paragraph is supplemented by the following.

When truck mixers are equipped with automated water or chemical admixture measurement and slump or slump flow monitoring equipment, the addition of water or chemical admixtures during transit is allowed. Reports generated by this equipment must be submitted to the Engineer daily.

Article 421.4.6.2., "Delivering Concrete," the fifth paragraph is voided and replaced with the following. Begin the discharge of concrete delivered in truck mixers within the times listed in Table 14. Concrete delivered after these times, and concrete that has not begun to discharge within these times will be rejected.

Article 421.4.8.3., "Testing of Fresh Concrete," is voided and replaced with the following.

Testing Concrete. The Engineer, unless specified in other Items or shown on the plans, will test the fresh and hardened concrete in accordance with the following methods:

- Slump. Tex-415-A;
- Air Content. Tex-414-A or Tex-416-A;
- Temperature. Tex-422-A;
- Making and Curing Strength Specimens. Tex-447-A;
- Compressive Strength. Tex-418-A;
- Flexural Strength. Tex-448-A; and
- Maturity. Tex-426-A.

Flexural strength and maturity specimens will not be made unless specified in other items or shown on the plans.

Concrete with slump less than minimum required after all addition of water withheld will be rejected, unless otherwise allowed by the Engineer. Concrete with slump exceeding maximum allowed may be used at the Contractor's option. If used, Engineer will make, test, and evaluate strength specimens as specified in Article 421.5., "Acceptance of Concrete." Acceptance of concrete not meeting air content or temperature requirements will be determined by Engineer. Fresh concrete exhibiting segregation and excessive bleeding will be rejected.

Article 421.4.8.3.1., "Job-Control Testing," is voided and not replaced.

Special Provision to Item 423
Retaining Walls

Item 423, "Retaining Walls" 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 423.2.1., "General" is supplemented with the following:

Construct permanent retaining walls approved for use in accordance with DMS 4800, "Proprietary Earth Retaining Wall System," and on the Approved System list for Concrete Block Retaining Walls Systems and Mechanically Stabilized Earth Panel Type Systems.

Article 423.2.4.2., "Select." The following sentence will be added to the fifth paragraph:

When Type CS select fill is used for cement stabilized backfill, the Plasticity Index (PI) as determined by Test Method Tex-106-E should not exceed six.

Special Provision to Item 425
Precast Prestressed Concrete Structural Members

Item 425, "Precast Prestressed Concrete Structural Members" 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.

Section 2.3., "Prestressing Steel." The first bullet is voided and replaced with the following.

- Seven-wire steel strand meeting DMS-4500, "Steel Strand, Uncoated Seven-Wire Low Relaxation for Prestressed Concrete."

Section 2.3., "Prestressing Steel." The second paragraph is voided and replaced with the following.

Use 7-wire steel strand produced by a prequalified manufacturer on the list in the Department MPL maintained by the Materials and Tests Division. The Department may take samples in accordance with Tex-710-I to verify compliance with specification requirements.

Special Provision to Item 426
Post-Tensioning

Item 426, "Post-Tensioning" 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.

Section 2.1., "Prestressing Steel." The first bullet is voided and replaced with the following.

- Seven-wire steel strand meeting DMS-4500, "Steel Strand, Uncoated Seven-Wire Low Relaxation for Prestressed Concrete," or

Section 2.2., "Post-Tensioning System." The second bulleted item is voided and replaced with the following:

- Provide pre-packaged grouts in accordance with DMS-4670, "Grouts for Post-Tensioning." Do not use grouts that exceed the manufacturers' recommended shelf life or 6 mo. after date of manufacture, whichever is less.

Section 4.2., "Required Submittals." The section is voided and replaced with the following.

4.2. **Required Submittals.** Submit information required in this Section for post-tensioned elements, in addition to forming and falsework plans required by Item 420, "Concrete Substructures," and Item 424, "Precast Concrete Structural Members (Fabrication)." Include all necessary construction information in these submittals for cast-in-place and precast construction including, but not limited to the information required in this Section.

4.2.1. **Design Calculations**. Provide design procedures, coefficients, allowable stresses, tendon spacing, and clearances in accordance with the AASHTO LRFD *Bridge Design Specifications* and PTI/ASBI M50 unless otherwise shown on the plans. Submit enough calculations to support the proposed system and method of post-tensioning including friction loss diagrams. When the required jacking force for a particular type of tendon, duct, and configuration is furnished on the plans, design calculations are not required except to adjust for conditions different from those shown on the plans.

4.2.2. **Post-Tensioning Details**. Provide drawings with details that meet the requirements of PTI/ASBI M50 and this Specification.

4.2.3. **Grouting Plan**. Submit for approval written grouting procedures at least four weeks before the start of the element's construction. Include items required by PTI M55.

Include the names of people responsible for PT installation and grouting operations, with the foreman of each grouting crew certified as a PTI Level 2 Bonded PT Field Specialist and ASBI Certified Grouting Technician.

4.2.4. **Stressing Safety Plan**. Provide a plan to protect the public, workers, and Department personnel on and around the vicinity where post-tensioning operations are occurring.

Submit for approval, a detailed safety plan which identifies potential risk associated with post-tensioning operations, including but not limited to:

- tendon alignment,
- temporary shoring,
- ram operations, and
- stand anchorage.

Section 4.3., "Design Calculations." The section is voided and replaced with the following.

4.3. **Packaging, Storing, and Handling of Post-Tensioning Components**. Package, store, and handle post-tensioning steel, grout, duct, and other accessories in accordance with PTI/ASBI M50 and PTI M55 unless otherwise indicated. Acceptance and rejection criteria for strand will follow PTI/ASBI M50 and PTI M55.

The following exceptions apply:

- grout storage onsite will be limited to 30 days unless approval by the Engineer is given in advance of material delivery,
- install grout caps and ensure vents are closed at all times so that water and other contaminants cannot enter the duct before strand installation, and
- do not flush ducts at any time.

Section 4.4., "Packaging, Storing, and Handling of Post-Tensioning Components." The section is voided and replaced with the following.

4.4. **Duct and Prestressing Steel Installation for Post-Tensioning**. Follow PTI/ASBI M50 for duct and prestressing steel installation procedures and requirements unless otherwise specified. Verify that concrete strength requirements on the plans are met for stressing and staged loading of post-tensioned structural elements.

Stress the tendons within seven days of installing the strand in the ducts unless otherwise approved in advance. Follow the tensioning procedure noted in the approved post-tensioning details.

Section 4.5., "Duct and Prestressing Steel Installation for Post-Tensioning." The section is voided and replaced with the following.

4.5. **Grouting**. Grout in accordance with PTI M55.

Grout within 14 days of tendon stressing unless otherwise specified or approved. Obtain approval to extend the grouting time before stressing tendons.

Do not allow the grout temperature to exceed 85°F during mixing and pumping. Do not grout when the ambient temperature is below 35°F. Field-test the grout in accordance with Table 1 during grout installation. Perform field-testing by trained personnel at the Contractor's expense while witnessed by the Engineer. Pump at the lowest pressure possible that will maintain a continuous flow of grout.

Table1
Requirements for Field-Testing of Grout

Test	Frequency	Requirement
Schupak Pressure Bleed Test (ASTM C1741)	1 per day	Per DMS-4670
Fluidity test (Tex-437-A, Method 2)	2 every 2 hr. 2 min. per day	per DMS-4670
Compressive Strength test (3" × 6" cylinders)	1 per day	per DMS-4670
Mud Balance test (Tex-130-E, Part II)[1, 2]	2 per day	per PTI M55

1. Take one sample from the mixer and one sample from the farthest duct outlet.
2. Verify wet density is within the range established by the department.

Section 4.6., "Grouting." The section is voided and not replaced.

Article 5., "MEASUREMENT AND PAYMENT." The section is voided and replaced with the following.

5. **MEASUREMENT**

This Item will be measured by the each PT element or member. An element or member is defined by one of the following individual components.

- PT Cap

- PT Column
- PT Bent
- Other elements shown in the plans.

The PT may extend into other elements which is subsidiary to the main element being post-tensioned.

6. **PAYMENT**

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "PT" for the member type shown on the plans. This price is full compensation for submittals, mock-ups, prestressing steel, post-tensioning, ducts, grout fittings, grout, end anchorages, bearing plates, equipment, labor, materials, tools, and incidentals. Materials furnished for testing will not be paid for directly.

Post-tensioning of precast members, tensioned at a fabrication plant, will not be paid for directly but will be subsidiary to pertinent Items.

Special Provision to Item 427
Surface Finishes for Concrete

Item 427, "Surface Finishes for Concrete" 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 427.2.1 "Coatings," is supplemented with the following:

Epoxy Waterproofing. Provide Type X Epoxy per DMS-6100 "Epoxies and Adhesives." Match color of coating with Federal Standard 595C color 35630, concrete gray, unless otherwise shown on the plans.

Article 427.4.2.2 "Application," is supplemented with the following:

Epoxy Waterproofing. Mix epoxy per manufacturer's instructions. Apply the coating on a dry surface at a maximum application rate of 100 sq. ft per gallon. Apply a thin uniform film of mixed epoxy to the substrate by the use of a short nap roller or brush. The epoxy may be sprayed following the thinning requirements of the manufacturer. No more than 15% reduction is permitted.

Match the color of the applied coating with the color standard shown on the plans. Apply when ambient temperature is between 50°F and 100°F.

Article 427.6 "Payment," the second paragraph is voided and replaced in its entirety with:

When a surface finish for concrete is specified as a pay item, 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 "Adhesive Grout Finish," "Concrete Paint Finish," "Opaque Sealer Finish," "Silicone Resin Paint Finish," "Epoxy Waterproof Finish," or "Blast Finish." This price is full compensation for materials; cleaning and preparing surfaces; application of materials; and equipment, labor, tools, and incidentals.

Special Provision to Item 434
Bridge Bearings

Item 434, "Bridge Bearings" 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.

Section 434.2.1., "Plain and Laminated Elastomeric Bearings," is voided and replaced with the following:

Manufacturers of plain and laminated elastomeric bearing pads must be approved in accordance with DMS-7365, "Qualification Procedure for Elastomeric Bridge Bearing Pad Manufacturers." The Materials and Tests Division (MTD) maintains a list of approved elastomeric bridge bearing pad manufacturers.

Manufacturers that produce laminated elastomeric bearings with a top steel plate or special components (steel guide bars and bottom plate) must comply with AASHTO's NTPEP Committee Work Plan for Evaluation of Plain and Laminated Elastomeric Bridge Bearing Manufacturers. DMS-7365 does not apply to manufacturers of bridge bearings where the laminated elastomeric bearing pad is a component of the completed bearing assembly.

Section 434.2.1.1., "Elastomer," is voided and replaced with the following:

Provide elastomer for bearings formulated from previously unvulcanized 100% virgin polychloroprene rubber polymers meeting the physical properties, heat resistance, and compression set requirements of AASHTO M 251, Table X1.1, unless otherwise shown on the plans. Do not provide bearings containing previously vulcanized synthetic rubber or other synthetic rubber-like polymers. Perform material tests on the finished product in accordance with the applicable test methods. Do not use standard laboratory test slabs for this purpose. Prepare test specimens from the finished product in accordance with ASTM D3183.

Obtain approval for each elastomer formulation before use on Department projects. Submit certified test results to MTD to prequalify and obtain approval of a particular formulation. Show actual test values obtained and the required values for the physical properties, heat resistance, and compression set of the elastomer when tested for compliance with the minimum requirements of AASHTO M 251, Table X1.1.

Forward samples (freight prepaid) to MTD, or their contracted testing laboratory when directed.

Submit only elastomer of the type or types to be supplied. Submit prequalification samples consisting of 2 finished bearing pads typical of the formulation and workmanship for Department projects. Submit 2 samples of each type when laminated and plain bearing pads are required. Laminated sample bearing pads may represent both plain bearing pads and laminated bearing pads for an elastomer formulation.

Plain sample bearing pads must measure 9 in. × 19 in. × 1 in. Laminated sample bearing pads must measure 9 in. × 14 in. × 1-1/2 in. with the following number of steel laminates:

- 50 durometer—3 steel laminates,
- 60 durometer—2 steel laminates, and
- 70 durometer—2 steel laminates.

Bond strength testing of laminated prequalification samples will be performed by the Department in accordance with Tex-601-J, Part I—"Bond Strength Test Method 1". The tested sample must achieve a minimum bond strength of 40 lbf/in. of width. Presence of chlorinated compounds (neoprene) in the elastomer will be verified by the Department in accordance with Tex-601-J, Part III—Chlorinated Compound Test Method 3.

Costs associated with testing elastomer formulations failing to conform to the requirements of this Item are borne by the bearing manufacturer. This cost will be assessed at the rate established by MTD at the time of testing.

Certify that the submitted samples are of the same basic elastomer formulation and of equivalent cure as the finished products to be furnished on Department projects.

Complete prequalification testing will be performed for each formulation at least once every 2 yr. and when necessary.

Section 434.2.1.2., "Steel Laminates," is voided and replaced with the following:

Provide steel laminates, for laminated bearing pads, of commercial grade steel strip or sheet with a thickness of 0.105 ±0.015 in.

Section 434.2.2.1.2., "Laminated Elastomeric Bearing Pad and Steel Plate," the first paragraph is amended to include the following sentence:

Bearing manufacturers that produce the laminated elastomeric bearing pad component of a sliding elastomeric bearing must comply with AASHTO's NTPEP Committee Work Plan for Evaluation of Plain and Laminated Elastomeric Bridge Bearing Manufacturers.

Section 434.3.1., "Plain and Laminated Elastomeric Bearings," is voided and replaced with the following:

Electronically submit shop drawings for the complete assembly before fabrication of laminated elastomeric bearings with or without steel top plates or special components in accordance with the plans and Item 441, "Steel Structures." Provide a bearing layout with the shop drawings.

Mold together components of a laminated bearing pad to form an integral unit free of voids or separations in the elastomer or between the elastomer and the steel laminates or plates, unless otherwise shown on the plans. Provide well-vulcanized elastomer between the laminates or plates and on the outer surfaces of the bearing pad that is uniform and integral and resists separation by mechanical means into separate, definite, well-defined elastomeric layers. Evidence of this layered construction, either at the outer surfaces or within the bearing pad, will be cause for rejection. Repair of damaged elastomer on sides of laminated bearing pads is not allowed for product acceptance. Repair of damaged elastomer on top or bottom surfaces of laminated bearing pads is allowed when approved.

Cover edges of steel laminates with 1/8 in. to 1/4 in. of elastomer except exposure of the laminates will be permitted at approved laminate restraining devices and around holes entirely enclosed in the finished structure. Position laminates within 1/8 in. of plan location.

Plain bearing pads may be molded individually, cut from previously molded strips or slabs molded to the full thickness of the finished bearing pads, or extruded and cut to length. The finish of cut surfaces must be ANSI 250, or smoother. The finished bearing pads must have no voids or separations detectable either at the bearing surfaces or within the bearing pad. Plain elastomeric bearing pads must be well vulcanized, uniform, and integral units of such construction that the bearing pad is incapable of being separated by any mechanical means into separate, definite, well-defined elastomeric layers. Evidence of layered construction either at the outer surfaces or within the bearing pad will be cause for rejection.

The permissible variation from the dimensions and configuration shown on the plans for both plain and laminated bearing pads will be as listed in AASHTO M 251, Table 2. Flash tolerance, finish, and appearance must meet the requirements of the latest edition of the Rubber Handbook published by the US Tire Manufacturer's Association, RMA F3 and T.063 for molded bearings, and RMA F2 for extruded bearings.

Perform required welding in accordance with Item 441, "Steel Structures." Manufacture guide bars, when required, so adjacent top and bottom bar surfaces are parallel to within 1/16 in. in the assembled position. The tolerance for diameter of anchor bolt holes is +1/8 in., −0. The maximum deviation for flatness of steel plates is 1/16 in. in any 24 in. or as shown on the plans.

Section 434.3.1.1., "Marking," the first paragraph is voided and replaced with the following:

Mark the bearing type on the surface of each bearing as shown on the plans. The marking must remain legible until placement in the structure. Permanently mark, in addition, laminated bearings with:

- manufacturer's name or trademark,
- lot number, and
- date of manufacture (month-year).

Section 434.3.1.2., "Testing and Acceptance," is voided and replaced with the following:

Perform testing, inspection, and acceptance of plain and laminated elastomeric bearing pads in accordance with DMS-7365, "Qualification Procedure for Elastomeric Bridge Bearing Pad Manufacturers."

For laminated elastomeric bearings with a steel top plate or special components (steel guide bars and bottom plate), apply a compression load of 2,250 psi or a stress approved by the Engineer to each bearing. Provide calibrated equipment per ASTM E4 for this compression testing. Each bearing will be acceptable if there is no visible evidence of bond failure or other damage and if the finished bearing meets other pertinent portions of this Item. Samples may be taken if the quality of production becomes questionable.

Section 434.3.2.2.1., "Lower Component," is voided and replaced with the following:

Manufacture one additional bearing lower component per project for testing purposes. Notify MTD, which will sample a bearing lower component at random from the lot, after bearings have been manufactured for a project. Forward selected samples (freight prepaid) to MTD, or to their contracted testing laboratory when directed. Lower component samples will be tested to the following:

- Tex-601-J, Part II—"Adhesion Test Method 2." Adhesion between the PTFE material and steel plate must meet a minimum 20 lb. per inch of width;
- Tex-601-J, Part III—"Chlorinated Compound Test Method 3." Laminated bearing pad elastomer must contain chlorinated compounds (neoprene); and
- PTFE physical properties in accordance with Table 1, with the exception of Melting Point Testing (ASTM D4894).

Costs associated with testing sliding elastomeric bearing lower component project samples failing to conform to these requirements are borne by the bearings manufacturer. This cost will be assessed at the rate established by Construction Division at the time of testing.

Section 434.3.3.2., "Testing and Acceptance." The last paragraph is voided.

Special Provision to Item 438
Cleaning and Sealing Joints

Item 438, "Cleaning and Sealing Joints," 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.

The first paragraph in Article 438.2., "Materials," the first paragraph is voided and replaced with the following:

Use sealants of the class specified on the plans that meet the requirements of DMS-6310, "Joint Sealants and Fillers" except as modified herein. Use primers recommended by the manufacturer of the sealant if required. When a foam-type joint seal is specified, provide one of the listed systems shown on the plans with material meeting the following:

- UV stable polymer impregnated foam body;
- rated for +/-50% contraction/expansion of joint opening;
- adhered to expansion joint surfaces with epoxy adhesive;
- factory attached traffic grade silicone with minimum thickness of 0.07 in. on upper surface;
- compatible field installed silicone caulk to attached silicone top to joint edges and for splicing;
- pre-compressed system for field installation; and
- provide a range of widths of joint seals to ensure the joint seal is in compression after installation is complete.

Article 438.4., "Construction," is amended by the following:

When foam-type joint seal is shown on the plans, provide a technician associated with the joint seal manufacturer for training and installation of the initial joint. Provide written instructions from the manufacturer for joint seal installation. Measure all joint openings and size the width of joint seal in accordance with manufacturer's specifications.

Article 438.6., "Payment," the second paragraph is voided and replaced by the following:

When shown as a pay item, 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 "Cleaning and Sealing Existing Joints," "Cleaning and Sealing Joints" of the class, if specified, "Cleaning and Sealing Joints (Foam)," and "Cleaning Existing Joints," and "Resizing and Sealing Joints." This price is full compensation for furnishing all materials; sawing, routing, and cleaning and installing; disposing of debris; and equipment, labor, tools, and incidentals.

Special Provision to Item 440
Reinforcement for Concrete

Item 440, "Reinforcement for Concrete," 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 440.2., "Materials," is supplemented with the following.

2.7. **Welded Deformed Bar Mat Reinforcement.** Provide welded deformed bar mats in accordance with ASTM A184 except as otherwise noted in this Specification. Fabricate welded bar mats from deformed steel bars in accordance with ASTM A706 by securely connecting every intersection with a process of electrical resistance welding that employs the principle of fusion combined with pressure. The bars must be assembled by automatic machines or by other suitable mechanical means that will assure accurate spacing and alignment of all bars of the finished product.

2.14. **Zinc-Coated, Hot-Dip Galvanized Class I or Class II Steel Reinforcement.** Provide zinc-coated, hot-dip galvanized Class I or Class II steel reinforcement in accordance with ASTM A767, Grade 60 or Grade 75, when shown on the plans and as allowed.

2.15. **Continuously Hot-Dip Galvanized Reinforcement (CGR).** Provide CGR in accordance with ASTM A1094 steel reinforcement, Grade 60 or Grade 75, when shown on the plans and as allowed.

Section 440.2.1., "Approved Mills." The second paragraph is voided and not replaced.

Section 440.2.5., "Weldable Reinforcing Steel," is supplemented with the following.

All welding operations must be performed before hot-dip galvanizing.

Section 440.2.8., "Mechanical Couplers," is voided and replaced with the following.

Use couplers of the type specified in DMS-4510, "Mechanical Couplers for Reinforcing Steel," Section 4510.6.1., "General Requirements," when mechanical splices in reinforcing steel bars are shown on the plans.

Furnish only couplers pre-qualified in accordance with DMS-4510, "Mechanical Couplers for Reinforcing Steel." Ensure sleeve-wedge type couplers are not used on coated reinforcing. Sample mechanical couplers in accordance with Tex-743-I for testing before use on individual projects. Test the mechanical couplers for every project in which mechanical couplers are used in accordance with Tex-744-I. Furnish couplers only at locations shown on the plans.

Furnish couplers for stainless reinforcing steel with the same alloy designation as the reinforcing steel.

Provide hot-dip or mechanically galvanized couplers when splicing galvanized reinforcing or CGR.

Section 440.2.11., "Low Carbon/Chromium Reinforcing Steel." The first sentence is voided and replaced by the following.

Provide deformed steel bars in accordance with ASTM A1035, Grade 100, Type CS, when low-carbon, chromium-reinforcing steel is required on the plans. Type CM will be permitted only if specified on the plans.

Section 440.3.1., "Bending," is supplemented with the following.

Do not bend hot-dip galvanized reinforcement. Only minor positioning adjustments are permitted.

Bending of CGR is permitted after galvanizing.

Section 440.3.5., "Placing." The following will be added to the fourth paragraph.

Use Class 1 or Class 1A supports with CGR. Provide epoxy- or plastic-coated tie wires and clips for use with epoxy-coated reinforcing steel.

Section 440.3.6.3., "Repairing Coating," is supplemented with the following:

Repair damaged galvanized surfaces in accordance with Section 445.3.5.2., "Repair Processes."

Special Provision to Item 441
Steel Structures

Item 441, "Steel Structures" 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.

Section 441.2.2., Approved Electrodes and Flux-Electrode Combinations," is voided and replaced with the following:

Use only electrodes and flux-electrode combinations conforming to AWS A5 specifications, and pertinent classifications for the applicable welding processes. When requested, submit a current Certificate of Conformance (COC) containing all test results as required by the applicable AWS A5 specification and welding code. Provide proof of Buy America compliance for welding consumables when requested. For bridge main member fabrication, submit the COC annually.

Section 441.2.3., "High-Strength Bolts," is revised and replaced by the following:

Use fasteners that meet Item 447, "Structural Bolting." Use galvanized fasteners on field connections of bridge members when ASTM F3125-Grade A325 bolts are specified, and steel is painted.

Section 441.3.1.5.1., "Plants," The second and third paragraphs are voided and replaced with the following:

Fabrication plants that produce the following non-bridge steel members must be approved in accordance with DMS-7380, "Steel Non-Bridge Member Fabrication Plant Qualification."

- Item 610, "Roadway Illumination Poles"
- Item 613, "High Mast Illumination Poles"
- Item 614, "High Mast Rings and Support Assemblies"
- Item 650, "Overhead Sign Support Structures"
- Item 654, "Sign Walkways"
- Item 686, "Traffic Signal Poles"
- Special Specification 6064, "Intelligent Transportation System (ITS) Poles."

The Materials and Tests Division (MTD) maintains a list of approved non-bridge fabrication plants on the Department MPL that produce these members.

Section 441.3.1.6.1., "Erection Drawings," the third paragraph is voided and replaced with the following:

Perform erection engineering evaluation of the structural adequacy and stability of constructing the bridge system for each step of the steel erection.

Section 441.3.1.5.3., "Nondestructive Testing (NDT)," is voided and replaced with the following:

Personnel performing NDT must be qualified in accordance with the applicable AWS code and the employer's Written Practice. Level III personnel who qualifies Level I and Level II technicians must be certified by ASNT for which the NDT Level III is qualified. In addition, NDT technicians must pass hands-on tests that MTD administers. This will remain current provided they continue to perform testing on Department materials as evidenced by test reports requiring their signature. A technician who fails any of the hands-on tests must wait 3 mo. or as approved otherwise before retesting. Qualification to perform NDT will be revoked when the technician's employment is terminated or when the technician goes 6 mo. without performing a test on a Department project. The technician must pass a new hands-on test to be re-certified. Testing of similar weld joints for non-Department projects may be considered by the Engineer instead of re-testing provided enough documentation is submitted with the signature of the project's Engineer. These requirements also apply to testing agencies, and individual third-party contractors.

Section 441.3.1.5.4., "Welding Procedure Specification Qualification Testing," is voided and replaced by the following:

For Fabricators qualified in accordance with DMS-7370, DMS-7380, or DMS-7395, laboratories performing procedure qualification testing for welding procedure specifications (WPSs) must be accredited by a nationally recognized agency that performs testing in accordance with ISO/International Electrotechnical Commission (IEC) 17025 in the mechanical field of testing.

Section 441.3.1.9., "Material Identification," is amended to include the following paragraph:

Low-stress stencil marks must have a radius instead of a sharp point. Acceptable stencils include dot, vibration, and rounded-V stencils. Label these stencils so that they are easily distinguishable from other stencils that are not low-stress.

Section 441.3.2.4.1., "Flange Tilt," the last sentence is voided and replaced with the following:

Minor jacking that does not deform the material will be permitted.

Section 441.3.2.5.3., "Magnetic Particle Testing," is voided and replaced with the following:

Use alternating current (AC) when using the yoke method unless otherwise approved. Welds may be further evaluated with half-wave rectified DC for subsurface indications. Centerline cracking may be detected with aluminum prod method when approved.

Section 441.3.5.8., "Hammering," is added to state the following:

Do not perform hammering on any portion of the member that causes the material to permanently deform. Avoid damage to the material by measures such as use of brass or aluminum hammers or by padding the area to be hammered.

Section 441.3.8.1., "Shop Painting," is amended to include with the following paragraph:

Measure the anchor profile after blast cleaning at random locations along the thermal cut surfaces. If specified anchor profile is not achieved over the entire flame cut surface, grind the edges and re-blast to achieve the required anchor pattern.

Section 441.3.9., "Handling and Storage of Materials," The second sentence of the second paragraph is replaced by the following:

Keep materials clean and avoid damaging of the applied coating.

Special Provision to Item 442
Metal for Structures

Item 442, "Metal for Structures" of the Standard Specifications is amended with respect to the clause cited below. No other clauses or requirements of this Item are waived or changed.

Section 442.2.1.3.3., "Fasteners." The first sentence of the first paragraph is replaced by the following:

Fasteners. Provide high-strength bolts that meet ASTM F3125-Grade A325 unless otherwise shown on the plans.

Section 442.2.1.3.3., "Fasteners." The third paragraph is deleted and not replaced.

Special Provision to Item 446
Field Cleaning and Painting Steel

For this project, Item 446, "Field Cleaning and Painting Steel," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 446.4.1., "Qualification," the first and second paragraphs are voided and replaced by the following:

> Submit to the Engineer documentation verifying SSPC QP 1 or NACE NIICAP AS-1 certification for work requiring the removal or application of coatings. Additionally, submit to the Engineer documentation verifying SSPC QP 2 Cat A or NACE NIICAP AS-2 certification when work requires removal of coatings containing hazardous materials. Maintain certifications throughout the project. No work may be performed without current and active certifications unless otherwise shown on the plans. The Engineer may waive certification requirements for minor, touch-up repair work and coating steel members repaired in accordance with Item 784, "Steel Member Repair."
>
> The Engineer may waive certification requirements, when stated on the plans, for the purpose of qualification in either contractor certification program if the project has been accepted as a qualification project as part of the process for obtaining SSPC QP1 Cat A or NACE NIICAP AS-1 certification. Submit certification applications and proof of acceptance before beginning work or provide SSPC QP 7 certification when required on the plans.

Section 446.4.7.3.2., "Classes of Cleaning," is amended with the following:

> Prepare all surfaces of painted steel members subsequently exposed from structural operations, such as deck removal or steel repair, in accordance with this Item. Prevent loose or damaged paint from entering the environment.

Special Provision to Item 448
Structural Field Welding

Item 448, "Structural Field Welding" 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 448.2., "Materials," the third paragraph is voided and replaced with the following:

Use only electrodes and flux-electrode combinations conforming to AWS A5 specifications and pertinent classifications for the applicable welding processes. When requested, submit a current Certificate of Conformance (COC) containing acceptable wording indicating Buy America compliance and all tests required by the applicable AWS specifications and welding codes. Tests must be conducted on electrodes of the same class, size, and brand; and manufactured by the same process and with the same materials as the electrodes to be furnished.

Special Provision to Item 449
Anchor Bolts

Item 449, "Anchor Bolts" of the Standard Specifications is amended with respect to the clause cited below. No other clauses or requirements of this Item are waived or changed.

Section 449.2.1., "Bolts and Nuts." Table 1 is replaced by the following:

Table 1
Bolt and Nut Standards

Specified Anchor Bolt Category	Bolt Standards	Nut Standards
Mild steel	ASTM A307 Gr. A, F1554 Gr. 36, or A36	ASTM A563
Medium-strength, mild steel	ASTM F1554 Gr. 55 with supplementary requirement S1	ASTM A194 Gr. 2 or A563 Gr. D or better
High-strength steel	ASTM F3125-Grade A325 or ASTM A449[1]	ASTM A194 or A563, heavy hex
Alloy steel	ASTM A193 Gr. B7 or F1554 Gr. 105	ASTM A194 Gr. 2H or A563 Gr. DH, heavy hex

1. **If headed bolts are specified, ASTM A449 bolts must be heavy hex head.**

Section 449.3.3.1,"Anchor Bolt Thread Lubricant Coating," The first sentence of the first paragraph is voided and replaced by the following.

Coat anchor bolt threads before installing nuts with an electrically conducting lubricant compound described in Section 449.3.3.2.1., "Definitions," for traffic signal poles, roadway illumination poles, high mast illumination poles, intelligent transportation system poles, overhead sign support structures, and steel electrical service supports.

Section 449.3.3.2,"Anchor Bolt Tightening Procedure," The first sentence of the first paragraph is voided and replaced by the following.

Tighten anchor bolts for traffic signal poles, shoe base and concrete traffic barrier base roadway illumination poles, high mast illumination poles, intelligent transportation system poles, and overhead sign support structures in accordance with this Section.

Special Provision to Item 450
Railing

Item 450, "Railing" 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.

Section 450.3.1.2., "Fabrication," is supplemented with the following.

Fabrication plants that produce metal railing (steel and aluminum) must be approved in accordance with DMS-7395, "Metal Railing Fabrication Plant Qualification." This required approval does not include fabricators of chain link fence. The Materials and Tests Division maintains a MPL of approved fabrication plants of metal railing.

Permanently mark each metal railing post base plate, at a visible location when erected, with the fabrication plant's insignia or trademark. For fabricated rail panels, provide this permanent mark on one post base plate, per panel.

Special Provision to Item 464
Reinforced Concrete Pipe

Item 464, "Reinforced Concrete Pipe," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 2.1., "Fabrication." The section is voided and replaced with the following.

Fabrication plants must be approved by the Materials and Tests Division in accordance with DMS-7305, "Fabrication and Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Drainage Structures," before furnishing precast reinforced concrete pipe for Departmental projects. The Department's MPL has a list of approved reinforced concrete pipe plants.

Furnish material and fabricate reinforced concrete pipe in accordance with DMS-7305, "Fabrication and Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Drainage Structures."

Section 2.3., "Marking." The first paragraph is voided and replaced with the following.

Furnish each section of reinforced concrete pipe marked with the following information specified in DMS-7305, "Fabrication and Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Drainage Structures."

- Class or D-Load of pipe,
- ASTM designation,
- Date of manufacture,
- Pipe size,
- Name or trademark of fabricator and plant location,
- Designation "TX" for precast units fabricated per DMS-7305;
- Designated fabricator's approval stamp for each approved unit,
- Pipe to be used for jacking and boring (when applicable), and
- Designation "SR" for pipe meeting sulfate-resistant concrete plan requirements (when applicable).

Section 2.5., "Causes for Rejection." The section is voided and replaced with the following.

Individual sections of pipe may be rejected for any of the conditions stated in the Annex of DMS-7305, "Fabrication and Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Drainage Structures."

Section 2.6., "Repairs." The section is voided and replaced with the following:

Make repairs, if necessary, as stated in the Annex of DMS-7305, "Fabrication and Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Drainage Structures."

Special Provision to Item 465
Junction Boxes, Manholes, and Inlets

Item 465, "Junction Boxes, Manholes, and Inlets," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 2.1., "Concrete," The section is voided and replaced with the following.

Furnish concrete per DMS-7305 for formed and machine-made precast junction boxes, manholes, and inlets. Furnish Class C concrete for cast-in-place junction boxes, manholes, and inlets unless otherwise shown on the plans.

Section 3.1., "Precast Junction Boxes, Manholes, and Inlets," The section is voided and replaced with the following.

Construct formed and machine-made precast junction boxes, manholes, and inlets in accordance with DMS-7305, "Fabrication and Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Drainage Structures" and the Contract Plans, except as otherwise noted in this Item.

Multi-project fabrication plants as defined in Item 424 "Precast Concrete Structural Members (Fabrication)," that produce junction boxes, manholes, and inlets will be approved by the Materials and Tests Division in accordance with DMS-7305, "Fabrication and Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Drainage Structures." The Department's MPL has a list of approved multi-project fabrication plants.

Section 3.1.1., "Lifting Holes," The section is voided and not replaced.

Section 3.1.2., "Marking." The section is voided and replaced with the following.

Marking. Clearly mark each precast junction box, manhole, and inlet unit with the following information:

- name or trademark of fabricator and plant location;
- product designation;
- ASTM designation (if applicable);
- date of manufacture;
- designation "TX" for precast units fabricated per DMS-7305;
- designated fabricator's approval stamp for each approved unit; and
- designation "SR" for product meeting sulfate-resistant concrete plan requirements (when applicable).

Special Provision to Item 502
Barricades, Signs and Traffic Handling

Item 502, "Barricades, Signs and Traffic Handling" of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 502.1., "Description," is supplemented by the following:

Temporary work-zone (TWZ) traffic control devices manufactured after December 31, 2019, must have been successfully tested to the crashworthiness requirements of the 2016 edition of the Manual for Assessing Safety Hardware (MASH). Such devices manufactured on or before this date and successfully tested to NCHRP Report 350 or the 2009 edition of MASH may continue to be used throughout their normal service lives. An exception to the manufacture date applies when, based on the project's date of letting, a category of MASH-2016 compliant TWZ traffic control devices are not approved, or are not self-certified after the December 31, 2019, date. In such case, devices that meet NCHRP-350 or MASH-2009 may be used regardless of the manufacture date.

Such TWZ traffic control devices include: portable sign supports, barricades, portable traffic barriers designated exclusively for use in temporary work zones, crash cushions designated exclusively for use in temporary work zones, longitudinal channelizers, truck and trailer mounted attenuators. Category I Devices (i.e., lightweight devices) such as cones, tubular markers and drums without lights or signs attached however, may be self-certified by the vendor or provider, with documentation provided to Department or as are shown on Department's Compliant Work Zone Traffic Control Device List.

Article 502.4., "Payment," is supplemented by the following:

Truck mounted attenuators and trailer attenuators will be paid for under Special Specification, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)." Portable Changeable Message Signs will be paid for under Special Specification, "Portable Changeable Message Sign." Portable Traffic Signals will be paid for under Special Specification, "Portable Traffic Signals."

Special Provision to Item 506

Temporary Erosion, Sedimentation, and Environmental Controls

Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls," 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 506.1., "Description." The second paragraph is voided and replaced by the following.

Contractor is considered primary operator to have day-to-day operational control as defined in TPDES GP TXR150000.

1.1. For projects with soil disturbance of less than 1 acre, no submittal to TCEQ will be required but Contractor will follow SWP3. For projects with soil disturbance of 1acre to less than 5 acres a small site notice will be posted at the site. For projects with soil disturbance of 5 acres or more a Notice of Intent (NOI) is required and a large site notice posted at site. Postings will be in accordance with TPDES GP TXR150000. Postings not associated with project specific locations will be in same location as Department's postings.

1.2. Notice of Intent (NOI). Submit a NOI, if applicable, with the TCEQ under the TPDES GP TXR150000 at least 7 days prior to commencement of construction activities at the project site. Provide a signed copy to the Engineer and any other MS4 operators at the time of submittal. The Department will submit their NOI prior to contractor submission and will provide a copy for Contractor's use in completing the Contractor's NOI form.

1.3. Notice of Change (NOC). Upon concurrence of the Engineer, submit a NOC, if applicable, to the TCEQ within 14 days of discovery of a change or revision to the NOI as required by the TPDES GP TXR150000. Provide a signed copy of the NOC to the Engineer and any other MS4 operators at the time of submittal.

1.4. Notice of Termination (NOT). Upon concurrence of the Engineer, submit a NOT, if applicable, to the TCEQ within 30 days of the Engineer's approval that 70% native background vegetative cover is met or equivalent permanent stabilization have been employed in accordance with the TPDES GP TXR 150000. Provide a signed copy of the NOT to the Engineer and any other MS4 operators at the time of submittal.

Section 506.3.1, "Contractor Responsible Person Environmental (CRPE) Qualifications and Responsibilities," is supplemented by the following:

3.1. Contractor Responsible Person Environmental (CRPE) Qualifications and Responsibilities. Provide and designate in writing at the preconstruction conference a CRPE and alternate CRPE who have overall responsibility for the storm water management program. The CRPE will implement stormwater and erosion control practices; will oversee and observe stormwater control measure monitoring and management; will monitor the project site daily and produce daily monitoring reports as long as there are BMPs in place or soil disturbing activities are evident to ensure compliance with the SWP3 and TPDES General Permit TXR150000. Daily monitor reports shall be maintained and made available upon request. During time suspensions when work is not occurring or on contract non-work days, daily inspections are not required unless a rain event has occurred. The CRPE will provide recommendations on how to improve the effectiveness of control measures. Attend the Department's preconstruction conference for the project. Ensure training is completed as identified in Section 506.3.3., "Training," by all applicable personnel before employees work on the project. Document and maintain and make available upon request, a list, signed by the CRPE, of all applicable Contractor and subcontractor employees who have completed the training. Include the employee's name, the training course name, and date the employee completed the training.

Section 506.3.3., "Training," is supplemented by the following:

Training is provided by the Department at no cost to the Contractor and is valid for 3 yr. from the date of completion. The Engineer may require the following training at a frequency less than 3 yr. based on environmental needs:

- "Environmental Management System: Awareness Training for the Contractor" (English and Spanish) (Approximate running time 20 min.), and
- "Storm Water: Environmental Requirements During Construction" (English and Spanish) (Approximate running time 20 min.).

The Contractor responsible person environmental (CRPE), alternate CRPE designated for emergencies, Contractor's superintendent, Contractor, and subcontractor lead personnel involved in soil disturbing or SWP3 activities must enroll in and complete the training listed below and maintain and make available upon request the certificate of completion. Training is provided by a third party and is valid for 3 yr. from the date shown on the Certificate of Completion. Coordinate enrollment as prescribed by the Department and pay associated fees for the following training:

- "Revegetation During Construction,"
- "Construction General Permit Compliance," and
- "Construction Stage Gate Checklist (CSGC)."

Training and associated fee will not be measured or paid for directly but are subsidiary to this Item.

Special Provision to Item 520
Weighing and Measuring Equipment

Item 520, "Weighing and Measuring Equipment" 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 520.2., "Equipment." The third paragraph is voided and replaced by the following.

Calibrate truck scales using weights certified by the Texas Department of Agriculture (TDA) or an equivalent agency as approved. Provide a written calibration report from a scale mechanic for truck scale calibrations. Cease plant operations during the checking operation. Do not use inaccurate or inadequate scales. Bring performance errors as close to zero as practicable when adjusting equipment.

Article 520.2., "Equipment." The fourth paragraph is amended to include the following:

At the Contractors option, an electronic ticket delivery system (e-ticketing) may be used instead of printed tickets. The use of e-ticketing will require written approval of the Engineer. At a minimum, the approved system will:

- Provide electronic, real-time e-tickets meeting the requirements of the applicable bid items;
- Automatically generate e-tickets using software and hardware fully integrated with the automated scale system used to weigh the material, and be designed in such a way that data input cannot be altered by the Contractor or the Engineer;
- Provide the Engineer access to the e-ticketing data in real-time with a web-based or app-based system compatible with iOS;
- Provide offline capabilities to prevent data loss if power or connectivity is lost;
- Require both the Contractor and the Engineer to accept or reject the e-ticket and provide the ability to record the information required by the applicable bid items, as well as any comments. Record the time of the approval/rejection and include it in the summary spreadsheet described below. Provide each party the capability to edit their respective actions and any entered information;

The Contractor may discontinue use of the e-ticket system and provide printed tickets as needed to meet the requirements of the applicable bid items.

Special Provision to Item 540
Metal Beam Guard Fence

Item 540, "Metal Beam Guard Fence" 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 540.4.7, "Measurement," is voided and replaced with the following:

> **Long Span System**. Measurement will be by each long span system, complete in place. Each long span system will be from the first CRT to the last CRT in the system.

Special Provision to Item 613
High Mast Illumination Poles

Item 613, "High Mast Illumination Poles" 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.

Section 613.3.3., "Fabrication," is voided and replaced with the following:

Fabrication. Fabricate and weld in accordance with Item 441, "Steel Structures," AWS D1.1, *Structural Welding Code—Steel*, and the requirements of this Item. Match-mark pole shaft sections as shown on the plans.

Fabrication plants that produce high mast illumination poles must be approved in accordance with DMS-7380, "Steel Non-Bridge Member Fabrication Plant Qualification." The Materials and Tests Division maintains a Material Producer List (MPL) of approved high mast illumination pole fabrication plants.

Provide circumferential welds only at the top attachment and base plates. Grind or smooth the longitudinal seam welds to the same radius as contacted shaft corners for the length of the lap plus at least 6 in. at each slip joint splice. Ensure acceptable seam weld profiles for the remainder of the pole shaft. Provide full-penetration longitudinal seam welds for a length of 1.5 diameters plus at least 6 in. in outer sections at splices and base plates. Provide 85% minimum penetration in longitudinal seam welds at other pole sections. Perform at least 10% ultrasonic testing (UT) of longitudinal seam welds with a Department approved procedure to ensure 85% minimum penetration where specified. Perform testing at a minimum of three locations on each shaft (top, middle, and bottom). The minimum length of each test area must be 10 in. If minimum penetration is not achieved in any of the tested areas, test an additional 24 in. beyond the originally selected test areas requiring 85% penetration. Test the entire shaft seam weld if any locations within the additional 24 in. test areas does not achieve 85% penetration. Repair the deficient areas with a Department approved repair procedure and retest to confirm minimum penetration. Provide longitudinal seam weld and fit-up that will minimize acid entrapment during later galvanizing. Use at most two longitudinal seam welds in each section.

Permanently mark each pole base plate with the insignia of the fabrication plant. Place the mark on the pole base plate adjacent to the handhole access compartment.

Hot-dip galvanize fabricated pole sections and associated parts in accordance with Item 445, "Galvanizing." Provide punched, drilled, or mechanically guided thermal-cut holes in steel parts or members, when allowed, before galvanizing. Mechanically guided thermal-cut hole quality shall be per Item 445, "Galvanizing." Fabrication tolerances are given in Table 1.

Perform UT of the shaft to base plate weld joint after galvanizing with a Department approved procedure to determine if any toe cracks are present in the ground sleeve. Remove and repair toe cracks with an approved repair procedure and retest.

Table 1
Fabrication Tolerances

Part	Dimension	Tolerance (in.)
Pole shaft	Length (unassembled sections)	±1
	Shaft Thickness[1]	+0.12, –0.02
	I.D. of outside slip fitting	+1/8, –1/16
	O.D. of inside slip fitting	+1/32, –1/8
	Difference between flats or diameter[2]	±1/4
	Straightness	1/8 in 10 ft.
	Attachment locations	±1

Part	Dimension	Tolerance (in.)
Assembled pole shaft	Perpendicular to base plate	1/8 in 24 in.
	Shaft centered on base plate	±1/4
	Twist in shaft[3]	4° in 100 ft.
	Position of winch channel	±1/4
Base plate	Overall	±1/4
	Thickness	+1/4, –1/16
	Deviations from flat	3/16 in 24 in.
	Spacing between holes	±3/16
	Bolt hole size	±1/16
Anchor bolt templates	Outside diameter	±1/8
	Inside diameter	+1/4
	Thickness	+1/4, –1/32
	Spacing between holes	±1/16
	Bolt hole size	±1/16
Anchor bolts	Length	±1/2
	Threaded Length	±1/2
	Galvanized Length	–1/4
Misc.	Bolt hole spacing	±1/16

1. Adjust pole diameter if shaft thickness exceeds nominal thickness by 0.02 in. or more. Change the splice length for this adjustment.
2. Applies only to bottom end of bottom shaft section, and top end of the top shaft section.
3. The Department may accept an excessive twist for individual pole sections, provided the top of pole is within twist tolerance for assembled sections.

Special Provision to Item 636
Signs

Item 636, "Signs" of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 636.3.1, "Fabrication." is deleted.

Section 636.3.1.2, "Sheeting Application." The last sentence of the fourth paragraph is voided and replaced by the following.

Do not splice sheeting or overlay films for signs fabricated with ink or with colored transparent films.

Special Provision to Item 643
Sign Identification Decals

Item 643, "Sign Identification Decals," 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 2. "Materials." The sign identification decal design shown in Figure 1 and the description for each row in Table 1 are supplemented by the following.

Texas Department of Transportation												
C	**Fabrication Date**										**T**	**1**
J	F	M	A	M	J	J	A	S	O	N	D	**2**
	201		202		203		204		205			**3**
	0	1	2	3	4	5	6	7	8	9		**4**
Sheeting MFR - Substrate												
A	B	C	D	E	F	G	H	J	K	L	M	**5**
Film MFR												
A	B	C	D	E	F	G	H	J	K	L	M	**6**
Sheeting MFR - Legend												
A	B	C	D	E	F	G	H	J	K	L	M	**7**
Installation Date												
				0	1	2	3					**8**
	0	1	2	3	4	5	6	7	8	9		**9**
J	F	M	A	M	J	J	A	S	O	N	D	**10**
	201		202		203		204		205			**11**
	0	1	2	3	4	5	6	7	8	9		**12**
Name of Sign Fabricator **Physical Address** **City, State, Zip Code**												**13**

Figure 1
Decal Design (Row numbers explained in Table 1)

Table 1
Decal Description

Row Explanation
1 – Sign fabricator
2 – Month fabricated
3 – First 3 digits of year fabricated
4 – Last digit of year fabricated
5 – Manufacturer of the sheeting applied to the substrate
6 – Film (colored transparent or non-reflective black) manufacturer
7 – Manufacturer of the sheeting for the legend
8 – Tens digit of date installed
9 - Ones digit of date installed
10 – Month installed
11 – First 3 digits of year installed
12 – Last digit of year installed
13 – Name of sign fabricator and physical location of sign shop

Special Provision to Item 650
Overhead Sign Supports

Item 650, "Overhead Sign Supports" 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.

Section 650.3.3., "Fabrication," is voided and replaced with the following:

Fabrication. Fabricate and weld in accordance with Item 441, "Steel Structures," AWS D1.1, *Structural Welding Code—Steel*, and the requirements of this Item.

Fabrication plants that produce overhead sign support structures must be approved in accordance with DMS-7380, "Steel Non-Bridge Member Fabrication Plant Qualification." The Materials and Tests Division maintains a Material Producer List (MPL) of approved overhead sign support structure fabrication plants.

For monotube type overhead sign supports fabricated with seam-welded pipe, locate the longitudinal seam weld at the neutral axis during the bending process of the post.

For cantilevered-truss type overhead sign support columns with diameters exceeding 30 in., one circumferential complete joint penetration weld splice is permitted per column. Locate the splice at a minimum height of half the column length. Provide mounting channels for the installation of traffic control devices unless otherwise shown on the plans.

Provide 100% ultrasonic testing (UT) in accordance with the AWS D1.1, *Structural Welding Code - Steel*, on all circumferential butt joint weld splices of:

- monotube type posts, and
- cantilevered-truss type columns.

UT acceptance and rejection criteria must be in accordance with AWS D1.1, for cyclically loaded nontubular connections in tension.

For alternate design cantilevered-truss type overhead sign support columns, perform at least 10% UT on longitudinal seam welds with a Department approved procedure to ensure minimum specified penetration. Perform testing at a minimum of three locations on each column (top, middle, and bottom). The minimum length of each test area must be 10 in. If minimum specified penetration is not achieved in any of the tested areas, test an additional 24 in. beyond the originally selected test areas requiring the specified minimum penetration. Test the entire column seam weld if any locations within the additional 24 in. test areas does not achieve the specified minimum penetration. Repair the deficient areas with a Department approved repair procedure and retest.

Measure required dimensions of truss type overhead sign support structures including the following:

- camber of overhead sign bridge trusses (in vertical position), and
- rise of cantilever overhead sign support trusses (in horizontal position).

Shop assemble monotube type overhead sign supports in the horizontal position to ensure specification compliance for all required dimensions, alignment, geometry, and fit.

Permanently mark sign support base plates with the fabrication plant's insignia. For monotube type supports, place the mark on the base plate adjacent to the hand hole access compartment.

Conformance to plans and other approved drawings does not relieve the Contractor of responsibility for proper fit of components.

Section 650.3.4., "Galvanizing," is voided and replaced with the following:

Galvanizing. Provide punched, drilled, or mechanically guided thermal-cut holes in steel parts or members, when allowed, before galvanizing. Mechanically guided thermal-cut hole quality should be per Item 445, "Galvanizing." Hot-dip galvanize all fabricated parts in accordance with Item 445, "Galvanizing."

Special Provision to Item 654
Sign Walkways

Item 654," Sign Walkways" of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 654.3.2, "Fabrication." The following language is added after the first paragraph.

Fabrication plants that produce sign walkways must be approved in accordance with DMS-7380, "Steel Non-Bridge Member Fabrication Plant Qualification." The Construction Division maintains a list of approved sign walkway fabrication plants on the Department's Material Producers List.

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Special Provision to Item 656
Foundations for Traffic Control Devices

Item 656, "Foundations for Traffic Control Devices" 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 3. "Construction.," the first paragraph is supplemented by the following:

Ensure the top of the foundation and anchor bolts meet specified requirements in relation to the final grade.

Special Provision to Item 666
Retroreflectorized Pavement Markings

Item 666, "Retroreflectorized Pavement Markings," 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.

Section 2.3., "Glass Traffic Beads." The first paragraph is voided and replaced by the following:

Furnish drop-on glass beads in accordance with DMS-8290, "Glass Traffic Beads," or as approved. Furnish a double-drop of Type II and Type III drop-on glass beads for longitudinal pavement markings where each type bead is applied separately in equal portions (by weight), unless otherwise approved. Apply the Type III beads before applying the Type II beads. Furnish Type II beads for work zone pavement markings and transverse markings or symbols.

Section 4.3.1., "Type I Markings.," is supplemented by the following:

4.3.1.3. Spot Striping. Perform spot striping on a callout basis with a minimum callout quantity as shown on the plans.

Section 4.3.2., "Type II Markings.," is supplemented by the following:

4.3.2.1. Spot Striping. Perform spot striping on a callout basis with a minimum callout quantity as shown on the plans.

Section 4.4., "Retroreflectivity Requirements.," is voided and replaced by the following.

Type I markings for Contracts totaling more than 20,000 ft. of pavement markings must meet the following minimum retroreflectivity values for all longitudinal edgeline, centerline or no passing barrier-line, and lane line markings when measured any time after 3 days, but not later than 10 days after application.

- White markings: 250 millicandelas per square meter per lux (mcd/m^2/lx)
- Yellow markings: 175 mcd/m^2/lx

Retroreflectivity requirements for Type I markings are not required for Contracts with less than 20,000 ft. of pavement markings or Contracts with callout work, unless otherwise shown on the plans.

Section 4.5., "Retroreflectivity Measurements.," is voided and replaced by the following:

Use a mobile retroreflectometer to measure retroreflectivity for Contracts totaling more than 50,000 ft. of pavement markings, unless otherwise shown on the plans. For Contracts with less than 50,000 ft. of pavement markings, mobile or portable retroreflectometers may be used at the Contractor's discretion. Coordinate with and obtain authorization from the Engineer before starting any retroreflectivity data collection.

Section 4.5.1., "Mobile Retroreflectometer Measurements." The last paragraph is voided and replaced by the following.

Restripe again at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the average of these measurements falls below the minimum retroreflectivity requirements. Take measurements every 0.1 miles a minimum of 10 days after this third application within that mile segment for that series of markings. If the markings do not meet minimum retroreflectivity after this third application, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

Section 4.5.2., "Portable Retroreflectometer Measurements." The first and second paragraphs are voided and replaced by the following.

Provide portable measurement averages for every 1.0 mile unless otherwise specified or approved. Take a minimum of 20 measurements for each 1-mi. section of roadway for each series of markings (e.g., edgeline, center skip line, each line of a double line) and direction of traffic flow when using a portable reflectometer. Measure each line in both directions for centerlines on two-way roadways (i.e., measure both double solid lines in both directions and measure all center skip lines in both directions). The spacing between each measurement must be at least 100 ft. The Engineer may decrease the mileage frequency for measurements if the previous measurements provide satisfactory results. The Engineer may require the original number of measurements if concerns arise.

Restripe at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the averages of these measurements fail. Take a minimum of 10 more measurements after 10 days of this second application within that mile segment for that series of markings. Restripe again at the Contractor's expense with a minimum of 0.060 in. (60 mils) of Type I marking material if the average of these measurements falls below the minimum retroreflectivity requirements. If the markings do not meet minimum retroreflectivity after this third application, the Engineer may require removal of all existing markings, a new application as initially specified, and a repeat of the application process until minimum retroreflectivity requirements are met.

Section 4.6. "Performance Period." The first sentence is voided and replaced by the following:

All longitudinal markings must meet the minimum retroreflectivity requirements within the time frame specified. All markings must meet all other performance requirements of this specification for at least 30 calendar days after installation.

Article 6. "Payment." The first two paragraphs are voided and replaced by the following.

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 "Pavement Sealer" of the size specified; "Retroreflectorized Pavement Markings" of the type and color specified and the shape, width, size, and thickness (Type I markings only) specified, as applicable; "Retroreflectorized Pavement Markings with Retroreflective Requirements" of the types, colors, sizes, widths, and thicknesses specified; "Retroreflectorized Profile Pavement Markings" of the various types, colors, shapes, sizes, and widths specified; or "Reflectorized Pavement Marking (Call Out)" of the shape, width, size, and thickness (Type I markings only) specified, as applicable; or "Pavement Sealer (Call Out)" of the size specified.

This price is full compensation for materials, application of pavement markings, equipment, labor, tools, and incidentals.

Special Provision to Item 672
Raised Pavement Markings

For this project, Item 672, "Raised Pavement Markings," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 672.3., "Construction," the twelfth paragraph is voided and replaced by the following:

Provide a 30-day performance period that begins the day following written acceptance for each separate location or patch. The date of written acceptance will be the last calendar day of each month for the RPMs installed that month for the completed separate project locations. This written acceptance does not constitute final acceptance.

Article 672.3., "Construction," is supplemented by the following:

672.3.1. Raised Pavement Markers Patch. Raised Pavement Markers will be in accordance with Item 672, "Raised Pavement Markers." Unless otherwise directed in the General Notes and Specification Data, a patch will be defined as 1,000 LF or less along the center line of the roadway. The Engineer will determine whether to remove and place markers on the entire roadway segment or just the patch areas. Unless otherwise directed on the plans, the Contractor will remove temporary pavement markings (tabs or temporary tape) prior to placement of permanent markers.

Article 672.5., "Payment," the first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid at the unit price bid for "Reflectorized Pavement Marker," "Traffic Button," "Plowable Reflectorized Pavement Marker," or "Reflectorized Pavement Marker (Patch)" of the types specified.

RPMs INSTALLATION RECORD

The 30-day performance period begins the day after written acceptance for each separate location. The date of written acceptance will be the last calendar day of each month for the RPMs installed that month for the completed separate project locations.

COUNTY HIGHWAY	CONTROL PROJECT	LIMITS FROM LIMITS TO	MONTH/YR OF INSTALLATION

Contractor signature _____ _____
Date

Department signature _____ _____
Date

Special Provision to Special Specification 3096 Asphalts, Oils, and Emulsions

Special Specification 3096, "Asphalts, Oils, and Emulsions," is amended with respect to the clause cited below. No other clause or requirements of this Item are waived or changed.

Section 3096.2.2., Table 3 Polymer-Modified Asphalt Cement has been voided and replaced by the following:

Table 3
Polymer-Modified Asphalt Cement

Property	Test Procedure	Polymer-Modified Viscosity Grade											
		AC-12-5TR		NT-HA[1]		AC-15P		AC-20XP		AC-10-2TR		AC-20-5TR	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Polymer		TR		–		SBS		SBS		TR		TR	
Polymer content, % (solids basis)	Tex-533-C or Tex-553-C	5.0	–	–	–	3.0	–	–	–	2.0	–	5.0	–
Dynamic shear, G*/sin δ, 82°C, 10 rad/s, kPa	T 315	–	–	1.0	–	–	–	–	–	–	–	–	–
Dynamic shear, G*/sin δ, 64°C, 10 rad/s, kPa	T 315	–	–	–	–	–	–	1.0	–	–	–	1.0	–
Dynamic shear, G*/sin δ, 58°C, 10 rad/s, kPa	T 315	1.0	–	–	–	–	–	–	–	1.0	–	–	–
Viscosity													
140°F, poise	T 202	1,200	–	–	–	1,500	–	2,000	–	1,000	–	2,000	–
275°F, poise	T 202	–	–	–	–	–	8.0	–	–	–	8.0	–	10.0
275°F, Pa-s	T 316	–	–	–	4.0	–	–	–	–	–	–	–	–
Penetration, 77°F, 100 g, 5 sec.	T 49	110	150	–	25	100	150	75	115	95	130	75	115
Elastic recovery, 50°F, %	Tex-539-C	55				55	–	55	–	30	–	55	–
Polymer separation	Tex-540-C	None		–		None		None		None		None	
Flash point, C.O.C., °F	T 48	425		425		425	–	425	–	425	–	425	–
Tests on residue from RTFOT aging and pressure aging:	T 240 and R 28												
Creep stiffness	T 313												
S, -18°C, MPa		–	300	–	–	–	300	–	300	–	300	–	300
m-value, -18°C		0.300	–	–	–	0.300	–	0.300	–	0.300	–	0.300	–

1. This is a hot-applied TRAIL product.

Section 3096.2.5., Diluted Emulsions tables has been added.

Diluted Emulsions. Provide emulsified asphalt that is homogeneous, does not separate after thorough mixing, and meets the requirements for the specified type and grade in Tables 12A, and 12B, where the suffixes 50/50, 40/60, and 30/70 mean 50% emulsion diluted with 50% water; 40% emulsion diluted with 60% water, and 30% emulsion diluted with 70% water, respectively. For example, CSS-1H 40/60 means 40% CSS-1H diluted with 60% water and AE-P 30/70 means 30% AE-P diluted with 70% water.

Table 12A
Diluted CSS-1H

Property	Test Procedure	Type-Grade					
		Diluted Slow-Setting					
		CSS-1H 50/50		CSS-1H 40/60		CSS-1H 30/70	
		Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol 77°F, sec.	T 72	Report Only		Report Only		Report Only	
Distillation test:							
Residue by distillation, % by wt.	T 59	30	–	24	–	18	–
Oil distillate, % by volume of emulsion		–	0.5	–	0.5	–	0.5
Tests on residue from distillation:							
Penetration, 77°F, 100 g, 5 sec.	T 49	40	110	40	110	40	110
Solubility, %	T 44	97.5	–	97.5	–	97.5	–
Ductility, 77°F, 5 cm/min., cm	T 51	80	–	80	–	80	–

Table 12B
Diluted AE-P

Property	Test Procedure	Type–Grade					
		Diluted Slow-Setting					
		AE-P 50/50		AE-P 40/60		AE-P 30/70	
		Min	Max	Min	Min	Max	Min
Viscosity, Saybolt Furol 122°F, sec.	T 72	Report Only		Report Only		Report Only	
Asphalt emulsion distillation to 500°F followed by Cutback asphalt distillation of residue to 680°F:	T 59 & T 78						
Residue after both distillations, % by wt.		20	–	16	–	12	–
Total oil distillate from both distillations, % by volume of emulsion		12.5	20	10.0	16	7.5	12
Tests on residue after all distillations:							
Solubility, %	T 44	97.5	–	97.5	–	97.5	–
Float test, 122°F, sec.	T 50	50	200	50	200	50	200

Special Provision to Special Specification 6185
Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

Item 6185, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)" of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 4. "Measurement", is voided and replaced by the following:

4.1. **Truck Mounted Attenuator/Trailer Attenuator (Stationary).** This Item will be measured by the day. TMA/TAs must be set up in a work area and operational before a calendar day can be considered measureable. A day will be measured for each TMA/TA set up and operational on the worksite.

4.2. **Truck Mounted Attenuator/Trailer Attenuator (Mobile Operation).** This Item will be measured by the hour or by the day. The time begins once the TMA/TA is ready for operation at the predetermined site and stops when notified by the Engineer. When measurement by the hour is specified, a minimum of 4 hr. will be paid each day for each operating TMA/TA used in a mobile operation. When measurement by the day is specified, a day will be measured for each TMA/TA set up and operational on the worksite.

Special Specification 3021
Concrete Pavement Wide Flange Terminals

1. DESCRIPTION

Construct wide flange terminals for concrete pavement.

2. MATERIALS

Furnish materials conforming to the following:

- Item 360, "Concrete Pavement,"
- Item 421, "Hydraulic Cement Concrete,"
- Item 440, "Reinforcement for Concrete," and
- Item 442, "Metal for Structures."

Use ASTM A 36 steel for wide-flange structural steel. Shop-fabricate wide-flange beams in accordance with the plans. Unless otherwise shown on the plans, wide-flange beams are not required to be welded or spliced at longitudinal construction joints.

3. CONSTRUCTION

Construct concrete pavement wide flange terminals in accordance with the plans.

3.1. **Excavation, Backfilling, and Base Preparation**. Excavate and backfill in accordance with Item 400, "Excavation and Backfill for Structures," and the plans. Avoid over-excavation. Restore subgrade and base layers damaged by excavation. Construct subgrade, base, and pavement layers in accordance with the plans.

3.2. **Reinforcement and Structural Steel.** Secure reinforcement in position before concrete placement in accordance with Item 440, "Reinforcement for Concrete," and the plans. Accurately secure wide-flange beams in position in accordance with the plans and with sufficient supports to safely maintain alignment during concrete placement and finishing.

3.3. **Concrete Placement and Finishing.** Use Class P hydraulic cement concrete. Place hydraulic concrete pavement in accordance with Item 360, "Concrete Pavement." Place bridge approach slabs in accordance with Item 422, "Concrete Superstructures."

3.4. **Opening to Traffic.** Open concrete pavement terminal to traffic in conformance with Item 360, "Concrete Pavement."

4. MEASUREMENT

This Item will be measured by the foot of concrete pavement terminal complete in place. Measurement will be made perpendicular to the direction of the flow of traffic.

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 measurement or calculations will be made if adjustments of quantities are required.

5. PAYMENT

The work performed and the materials furnished in accordance with this Item and measured as specified under “Measurement” will be paid for at the unit price bid for “Wide Flange Pavement Terminals.”

This price is full compensation for excavation, disposal of waste material, backfilling, 12 in. cement treatment, hydraulic cement concrete (sleeper slab and support slab) underneath the concrete pavement, joint material, reinforcing steel, wide-flange beams, equipment, materials, labor, tools and incidentals.

Subgrade treatment, asphalt concrete, base material, and curbing required by the plans will be measured and paid for in accordance with pertinent Items. Concrete pavement constructed as part of the concrete pavement terminal will be paid for under Item 360, “Concrete Pavement.”

Special Specification 3096
Asphalts, Oils, and Emulsions

1. DESCRIPTION

Provide asphalt cements, cutback and emulsified asphalts, performance-graded asphalt binders, and other miscellaneous asphalt materials as specified on the plans.

2. MATERIALS

Provide asphalt materials that meet the stated requirements when tested in conformance with the referenced Department, AASHTO, and ASTM test methods. Use asphalt containing recycled materials only if the recycled components meet the requirements of Article 6.9., "Recycled Materials." Provide asphalt materials that the Department has preapproved for use in accordance with Tex-545-C, "Asphalt Binder Quality Program."

Inform the Department of all additives or modifiers included in the asphalt binder as part of the facility quality plan, as required by Tex-545-C, "Asphalt Binder Quality Program," and provide that information to Department personnel. The Department reserves the right to prohibit the use of any asphalt additive or modifier.

Limit the use of polyphosphoric acid to no more than 0.5% by weight of the asphalt binder.

The use of re-refined engine oil bottoms is prohibited.

Acronyms used in this Item are defined in Table 1.

Table1
Acronyms

Acronym	Definition
Test Procedure Designations	
Tex	Department
T or R	AASHTO
D	ASTM
Polymer Modifier Designations	
P	polymer-modified
SBR or L	styrene-butadiene rubber (latex)
SBS	styrene-butadiene-styrene block co-polymer
TR	tire rubber (from ambient temperature grinding of truck and passenger tires)
AC	asphalt cement
AE	asphalt emulsion
AE-P	asphalt emulsion prime
A-R	asphalt-rubber
C	cationic
EAP&T	emulsified asphalt prime and tack
EBL	emulsified bonding layer
FDR	full depth reclamation
H-suffix	harder residue (lower penetration)
HF	high float
HY	high yield
MC	medium-curing
MS	medium-setting
PCE	prime, cure, and erosion control
PG	performance grade
RC	rapid-curing
RS	rapid-setting
S-suffix	stockpile usage
SCM	special cutback material
SS	slow-setting
SY	standard yield
TRAIL	tracking resistant asphalt interlayer

2.1. **Asphalt Cement**. Provide asphalt cement that is homogeneous, water-free, and nonfoaming when heated to 347°F, and meets the requirements in Table 2.

Table 2
Asphalt Cement

Property	Test Procedure	Viscosity Grade									
		AC-0.6		AC-1.5		AC-3		AC-5		AC-10	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity	T 202										
140°F, poise		40	80	100	200	250	350	400	600	800	1,200
275°F, poise		0.4	–	0.7	–	1.1	–	1.4	–	1.9	–
Penetration, 77°F, 100g, 5 sec.	T 49	350	–	250	–	210	–	135	–	85	–
Flash point, C.O.C., °F	T 48	425	–	425	–	425	–	425	–	450	–
Solubility in trichloroethylene, %	T 44	99.0	–	99.0	–	99.0	–	99.0	–	99.0	–
Spot test	Tex-509-C	Neg.		Neg.		Neg.		Neg.		Neg.	
Tests on residue from RTFOT:	T 240										
Viscosity, 140°F, poise	T 202	–	180	–	450	–	900	–	1,500	–	3,000
Ductility,[1] 77°F 5 cm/min., cm	T 51	100	–	100	–	100	–	100	–	100	–

1. If AC-0.6 or AC-1.5 ductility at 77°F is less than 100 cm, material is acceptable if ductility at 60°F is more than 100 cm.

2.2. **Polymer-Modified Asphalt Cement**. Provide polymer-modified asphalt cement that is smooth, homogeneous, and meets the requirements Table 3. Supply samples of the base asphalt cement and polymer additives if requested.

Table 3
Polymer-Modified Asphalt Cement

Property	Test Procedure	Polymer-Modified Viscosity Grade											
		AC-12-5TR		NT-HA[1]		AC-15P		AC-20XP		AC-10-2TR		AC-20-5TR	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Polymer		TR		–		SBS		SBS		TR		TR	
Polymer content, % (solids basis)	Tex-533-C or Tex-553-C	5.0	–	–	–	3.0	–	–	–	2.0	–	5.0	–
Dynamic shear, G*/sinδ, 82°C, 10 rad/s, kPa	T 315			1.0	–								
Dynamic shear, G*/sinδ, 64°C, 10 rad/s, kPa	T 315	–	–	–	–	–	–	1.0	–	–	–	1.0	–
Dynamic shear, G*/sinδ, 58°C, 10 rad/s, kPa	T 315	1.0	–	–	–	–	–	–	–	1.0	–	–	–
Viscosity 140°F, poise 275°F, poise	 T 202 T 202	 1,200	 –	 –	 4,000	 1,500 –	 – 8.0	 2,000 –	 – –	 1,000 –	 – 8.0	 2,000 –	 – 10.0
Penetration, 77°F, 100 g, 5 sec.	T 49	110	150	–	25	100	150	75	115	95	130	75	115
Ductility, 5cm/min., 39.2°F, cm	T 51					–	–	–	–	–	–	–	–
Elastic recovery, 50°F, %	Tex-539-C	55	–			55	–	55	–	30	–	55	–
Softening point, °F	T 53	113	–	170	–	–	–	120	–	110	–	120	–
Polymer separation, 5 hr.	Tex-540-C	None				None		None		None		None	
Flash point, C.O.C., °F	T 48	425	–	425	–	425	–	425	–	425	–	425	–
Tests on residue from RTFOT aging and pressure aging:	T 240 and R 28												
Creep stiffness S, -18°C, MPa m-value, -18°C	T 313	 – 0.300	 300 –	 – –	 – –	 – 0.300	 300 –	 – 0.300	 300 –	 – 0.300	 300 –	 – 0.300	 300 –

1. Non-Tracking Hot Applied Tack Coat - TRAIL product

2.3. **Cutback Asphalt**. Provide cutback asphalt that meets the requirements of Tables 4, 5, and 6, for the specified type and grade. Supply samples of the base asphalt cement and polymer additives if requested.

Table 4
Rapid-Curing Cutback Asphalt

Property	Test Procedure	Type–Grade					
		RC-250		RC-800		RC-3000	
		Min	Max	Min	Max	Min	Max
Kinematic viscosity, 140°F, cSt	T 201	250	400	800	1,600	3,000	6,000
Water, %	D95	–	0.2	–	0.2	–	0.2
Flash point, T.O.C., °F	T 79	80	–	80	–	80	–
Distillation test:	T 78						
Distillate, percentage by volume of total distillate to 680°F							
to 437°F		40	75	35	70	20	55
to 500°F		65	90	55	85	45	75
to 600°F		85	–	80	–	70	–
Residue from distillation, volume %		70	–	75	–	82	–
Tests on distillation residue:							
Viscosity, 140°F, poise	T 202	600	2,400	600	2,400	600	2,400
Ductility, 5 cm/min., 77°F, cm	T 51	100	–	100	–	100	–
Solubility in trichloroethylene, %	T 44	99.0	–	99.0	–	99.0	–
Spot test	Tex-509-C	Neg.		Neg.		Neg.	

Table 5
Medium-Curing Cutback Asphalt

Property	Test Procedure	Type–Grade							
		MC-30		MC-250		MC-800		MC-3000	
		Min	Max	Min	Max	Min	Max	Min	Max
Kinematic viscosity, 140°F, cSt	T 201	30	60	250	500	800	1,600	3,000	6,000
Water, %	D95	–	0.2	–	0.2	–	0.2	–	0.2
Flash point, T.O.C., °F	T 79	95	–	122	–	140	–	149	–
Distillation test:	T 78								
Distillate, percentage by volume of total distillate to 680°F									
to 437°F		–	35	–	20	–	–	–	–
to 500°F		30	75	5	55	–	40	–	15
to 600°F		75	95	60	90	45	85	15	75
Residue from distillation, volume %		50	–	67	–	75	–	80	–
Tests on distillation residue:									
Viscosity, 140°F, poise	T 202	300	1,200	300	1,200	300	1,200	300	1,200
Ductility, 5 cm/min., 77°F, cm	T 51	100	–	100	–	100	–	100	–
Solubility in trichloroethylene, %	T 44	99.0	–	99.0	–	99.0	–	99.0	–
Spot test	Tex-509-C	Neg.		Neg.		Neg.		Neg.	

Table 6
Special-Use Cutback Asphalt

Property	Test Procedure	Type–Grade					
		MC-2400L		SCM I		SCM II	
		Min	Max	Min	Max	Min	Max
Kinematic viscosity, 140°F, cSt	T 201	2,400	4,800	500	1,000	1,000	2,000
Water, %	D95	–	0.2	–	0.2	–	0.2
Flash point, T.O.C., °F	T 79	150	–	175	–	175	–
Distillation test:	T 78						
Distillate, percentage by volume of total distillate to 680°F							
to 437°F		–	–	–	–	–	–
to 500°F		–	35	–	0.5	–	0.5
to 600°F		35	80	20	60	15	50
Residue from distillation, volume %		78	–	76	–	82	–
Tests on distillation residue:							
Polymer		SBR		–		–	
Polymer content, % (solids basis)	Tex-533-C	2.0	–	–	–	–	–
Penetration, 100 g, 5 sec., 77°F	T 49	150	300	180	–	180	–
Ductility, 5 cm/min., 39.2°F, cm	T 51	50	–	–	–	–	–
Solubility in trichloroethylene, %	T 44	99.0	–	99.0	–	99.0	–

2.4. **Emulsified Asphalt**. Provide emulsified asphalt that is homogeneous, does not separate after thorough mixing, and meets the requirements for the specified type and grade in Tables 7, 8, 9, 10, and 10A-C.

Table 7
Emulsified Asphalt

Property	Test Procedure	Type–Grade									
		Rapid-Setting		Medium-Setting				Slow-Setting			
		HFRS-2		MS-2		AES-300		SS-1		SS-1H	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol	T 72										
77°F, sec.		–	–	–	–	75	400	20	100	20	100
122°F, sec.		150	400	100	300	–	–	–	–	–	–
Sieve test, %	T 59	–	0.1	–	0.1	–	0.1	–	0.1	–	0.1
Miscibility	T 59	–		–		–		Pass		Pass	
Cement mixing, %	T 59	–	–	–	–	–	–	–	2.0	–	2.0
Coating ability and water resistance:	T 59										
Dry aggregate/after spray		–		–		Good/Fair		–		–	
Wet aggregate/after spray		–		–		Fair/Fair		–		–	
Demulsibility, 35 mL of 0.02 N $CaCl_2$, %	T 59	50	–	–	30	–	–	–	–	–	–
Storage stability, 1 day, %	T 59	–	1	–	1	–	1	–	1	–	1
Freezing test, 3 cycles[1]	T 59	–		Pass		–		Pass		Pass	
Distillation test:	T 59										
Residue by distillation, % by wt.		65	–	65	–	65	–	60	–	60	–
Oil distillate, % by volume of emulsion		–	0.5	–	0.5	–	5	–	0.5	–	0.5
Tests on residue from distillation:											
Penetration, 77°F, 100 g, 5 sec.	T 49	100	140	120	160	300	–	120	160	70	100
Solubility in trichloroethylene, %	T 44	97.5	–	97.5	–	97.5	–	97.5	–	97.5	–
Ductility, 77°F, 5 cm/min., cm	T 51	100	–	100	–	–	–	100	–	80	–
Float test, 140°F, sec.	T 50	1,200	–	–	–	1,200	–	–	–	–	–

1. Applies only when the Engineer designates material for winter use.

Table 8
Cationic Emulsified Asphalt

Property	Test Procedure	Type–Grade											
		Rapid-Setting				Medium-Setting				Slow-Setting			
		CRS-2		CRS-2H		CMS-2		CMS-2S		CSS-1		CSS-1H	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol	T 72												
77°F, sec.		–	–	–	–	–	–	–	–	20	100	20	100
122°F, sec.		150	400	150	400	100	300	100	300	–	–	–	–
Sieve test, %	T 59	–	0.1	–	0.1	–	0.1	–	0.1	–	0.1	–	0.1
Cement mixing, %	T 59	–	–	–	–	–	–	–	–	–	2.0	–	2.0
Coating ability and water resistance:	T 59												
Dry aggregate/after spray		–		–		Good/Fair		Good/Fair		–		–	
Wet aggregate/after spray		–		–		Fair/Fair		Fair/Fair		–		–	
Demulsibility, 35 mL of 0.8% Sodium dioctyl sulfosuccinate, %	T 59	70	–	70	–	–	–	–	–	–	–	–	–
Storage stability, 1 day, %	T 59	–	1	–	1	–	1	–	1	–	1	–	1
Particle charge	T 59	Positive		Positive		Positive		Positive		Positive		Positive	
Distillation test:													
Residue by distillation, % by wt.	T 59	65	–	65	–	65	–	65	–	60	–	60	–
Oil distillate, % by volume of emulsion		–	0.5	–	0.5	–	7	–	5	–	0.5	–	0.5
Tests on residue from distillation:													
Penetration, 77°F, 100 g, 5 sec.	T 49	120	160	70	110	120	200	300	–	120	160	70	110
Solubility in trichloroethylene, %	T 44	97.5	–	97.5	–	97.5	–	97.5	–	97.5	–	97.5	–
Ductility, 77°F, 5 cm/min., cm	T 51	100	–	80	–	100	–		–	100	–	80	–

Table 9
Polymer-Modified Emulsified Asphalt

Property	Test Procedure	Type–Grade									
		Rapid-Setting		Medium-Setting				Slow-Setting			
		HFRS-2P		AES-150P		AES-300P		AES-300S		SS-1P	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol	T 72										
77°F, sec.		–	–	75	400	75	400	75	400	30	100
122°F, sec.		150	400					–	–	–	–
Sieve test, %	T 59	–	0.1	–	0.1	–	0.1	–	0.1	–	0.1
Miscibility	T 59	–		–		–		–		Pass	
Coating ability and water resistance:											
Dry aggregate/after spray	T 59	–		Good/Fair		Good/Fair		Good/Fair		–	
Wet aggregate/after spray		–		Fair/Fair		Fair/Fair		Fair/Fair		–	
Demulsibility, 35 mL of 0.02 N $CaCl_2$, %	T 59	50	–	–	–	–	–	–	–	–	–
Storage stability, 1 day, %	T 59	–	1	–	1	–	1	–	1	–	1
Breaking index, g	Tex-542-C	–	–								
Distillation test:[1]	T 59										
Residue by distillation, % by wt.		65	–	65	–	65	–	65	–	60	–
Oil distillate, % by volume of emulsion		–	0.5	–	3	–	5	–	7	–	0.5
Tests on residue from distillation:											
Polymer content, wt. % (solids basis)	Tex-533-C	3.0	–	–	–	–	–	–	–	3.0	–
Penetration, 77°F, 100 g, 5 sec.	T 49	90	140	150	300	300	–	300	–	100	140
Solubility in trichloroethylene, %	T 44	97.0	–	97.0	–	97.0	–	97.0	–	97.0	–
Viscosity, 140°F, poise	T 202	1,500	–	–	–	–	–	–	–	1,300	–
Float test, 140°F, sec	T 50	1,200	–	1,200	–	1,200	–	1,200	–	–	–
Ductility,[2] 39.2°F, 5 cm/min., cm	T 51	50	–	–	–	–	–	–	–	50	–
Elastic recovery,2 50°F, %	Tex-539-C	55	–	–	–	–	–	–	–	–	–
Tests on RTFO curing of distillation residue	T 240										
Elastic recovery, 50°F, %	Tex-536-C	–	–	50	–	50	–	30	–	–	–

1. Exception to T 59: Bring the temperature on the lower thermometer slowly to 350°F ±10°F. Maintain at this temperature for 20 min. Complete total distillation in 60 min. (±5 min.) from the first application of heat.
2. HFRS-2P must meet one of either the ductility or elastic recovery requirements.

Table 10
Polymer-Modified Cationic Emulsified Asphalt

Property	Test Procedure	Type–Grade											
		Rapid-Setting						Medium-Setting				Slow-Setting	
		CRS-2P		CHFRS-2P		CRS-2TR		CMS-1P[3]		CMS-2P[3]		CSS 1P	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol	T 72												
77°F, sec.		–	–	–	–	–	–	10	100	–	–	20	100
122°F, sec.		150	400	100	400	150	500	–	–	50	400	–	–
Sieve test, %	T 59	–	0.1	–	0.1	–	0.1	–	0.1	–	0.1	–	0.1
Demulsibility, 35 ml of 0.8% sodium dioctyl sulfosuccinate, %	T 59	70	–	60	–	40	–	–	–	–	–	–	–
Storage stability, 1 day, %	T 59	–	1	–	1	–	1	–	1	–	1	–	1
Breaking index, g	Tex-542-C	–	–	–	–	–	–	–	–	–	–	–	–
Particle charge	T 59	Positive		Positive		Positive		Positive		Positive		Positive	
Distillation test[1]:	T 59												
Residue by distillation, % by weight		65	–	65	–	65	–	30	–	60	–	62	–
Oil distillate, % by volume of emulsion		–	0.5	–	0.5	–	3	–	0.5	–	0.5	–	0.5
Tests on residue from distillation:													
Polymer content, wt. % (solids basis)	Tex-533-C	3.0	–	3.0	–	5.0[7]	–	–	–	–	–	3.0	–
Penetration, 77°F, 100 g, 5 sec.	T 49	90	150	80	130	90	150	30	–	30	–	55	90
Viscosity, 140°F, poise	T 202	1,300	–	1,300	–	1,000	–	–	–	–	–	–	–
Solubility in trichloroethylene, %	T44	97.0	–	95.0	–	98	–	–	–	–	–	97.0	–
Softening point, °F	T 53	–	–	–	–	–	–	–	–	–	–	135	–
Ductility, 77°F, 5 cm/min., cm	T 51	–	–	–	–	40	–	–	–	–	–	70	–
Float test, 140°F, sec.	T 50	–	–	1,800	–	–	–	–	–	–	–	–	–
Ductility,[2] 39.2°F, 5 cm/min., cm	T 51	50	–	–	–	–	–	–	–	–	–	–	–
Elastic recovery,[2] 50°F, %	Tex-539-C	55	–	55	–	–	–	–	–	–	–	–	–
Tests on residue from evaporative recovery:	R 78, Procedure B												
Nonrecoverable creep compliance of residue, 3.2 kPa, 52°C, kPa-[1]	T 350	–	–	–	–	–	–	–	2.0	–	4.0	–	–
Tests on rejuvenating agent:													
Viscosity, 140°F, cSt	T 201	–	–	–	–	–	–	50	175	50	175	–	–
Flash point, C.O.C., °F	T 48	–	–	–	–	–	–	380	–	380	–	–	–
Saturates, % by weight	D 2007	–	–	–	–	–	–	–	30	–	30	–	–
Solubility in n-pentane, % by weight	D 2007	–	–	–	–	–	–	99	–	99	–	–	–
Tests on rejuvenating agent after RTFO	T 240												
Weight Change, %		–	–	–	–	–	–	–	6.5	–	6.5	–	–
Viscosity Ratio		–	–	–	–	–	–	–	3.0	–	3.0	–	–
Tests on latex[4]:													
Tensile strength, die C dumbbell, psi	D 412[5]	–	–	–	–	–	–	800	–	800	–	–	–
Change in mass after immersion in rejuvenating agent, %	D 471	–	–	–	–	–	–	–	40[6]	–	40[6]	–	–

1. Exception to T 59: Bring the temperature on the lower thermometer slowly to 350°F (±0°F). Maintain at this temperature for 20 min. Complete total distillation in 60 min. (±5 min.) from the first application of heat.
2. CRS-2P must meet one of either the ductility or elastic recovery requirements.
3. With all precertification samples of CMS-1P or CMS-2P, submit certified test reports showing that the rejuvenating agent and latex meet the stated requirements. Submit samples of these raw materials if requested by the Engineer.
4. Preparation of latex specimens: use any substrate and recovery method which produces specimens of uniform dimensions and which delivers enough material to achieve desired residual thickness.
5. Cut samples for tensile strength determination using a crosshead speed of 20 in. per minute.
6. Specimen must remain intact after exposure and removal of excess rejuvenating agent.
7. Modifier type is tire rubber.

Table 10A
Non-Tracking Tack Coat Emulsion[1]

Property	Test Procedure	NT-HRE		NT-RRE		NT-SRE	
		Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol 77º F, sec.	T 72	15	–	15	–	10	100
Storage stability, 1 Day, %	T 59	–	1	–	1	–	1
Settlement, 5-day, %	T 59	–	5	–	5	–	5
Sieve test, %	T 59	–	0.30	–	0.30	–	0.1
Distillation test:[2]	T 59						
Residue by distillation, % by wt.		50	–	58	–	50	–
Oil distillate, by volume of emulsion		–	1.0	–	1.0	–	1.0
Test on residue from distillation:							
Penetration, 77ºF, 100 g, 5 sec.	T 49	–	20	15	45	40	90
Solubility in trichloroethylene, %	T 44	97.5	–	97.5	–	97.5	–
Softening point, ºF	T 53	150	–	–	–	–	–
Dynamic shear, G*/sin(δ), 82°C, 10 rad/s, kPa	T 315	1.0	–	–	–	–	–

1. Due to the hardness of the residue, these emulsions should be heated to 120-140°F before thoroughly mixing as the emulsion is being prepared for testing.
2. Exception to T 59: Bring the temperature on the lower thermometer slowly to 350ºF ± 10ºF. Maintain at this temperature for 20 min. Complete total distillation in 60 ± 5 min. from first application of heat.

Table10B
Spray Applied Underseal Membrane Polymer-Modified Emulsions (EBL)

Property	Test Procedure	Min	Max
Viscosity @ 77°F, SSF	T 72	20	100
Storage Stability[1], %	T 59	–	1
Demulsibility[2] Anionic emulsions – 35 mL of 0.02 N CaCl2, % Cationic emulsions – 35 mL of 0.8% sodium dioctyl sulfosuccinate, %	T 59	55	–
Sieve Test[3], %	T 59	–	0.05
Distillation Test[4]	T 59		
Residue by distillation, % by wt.		63	
Oil portion of distillate, % by vol.			0.5
Test on Residue from Distillation			
Elastic Recovery @ 50°F, 50 mm/min., %	Tex-539-C	60	–
Penetration @ 77°F, 100 g, 5 sec., 0.1 mm	T 49	80	130

1. After standing undisturbed for 24 hr., the surface must be smooth, must not exhibit a white or milky colored substance, and must be a homogeneous color throughout.
2. Material must meet demulsibility test for emulsions.
3. May be required by the Engineer only when the emulsion cannot be easily applied in the field.
4. The temperature on the lower thermometer should be brought slowly to 350°F ± 10°F and maintained at this temperature for 20 min. The total distillation should be completed in 60 ± 5 min. from the first application of heat.

Table 10C
Full-Depth Reclamation Emulsion (FDR EM)

Property	Test Procedure	Standard Yield (SY)		High Yield (HY)	
		Min	Max	Min	Max
Sieve test, %	T 59	–	0.1	–	0.1
Viscosity Saybolt Furol @ 77°F, sec.	T 59	20	100	20	100
Distillation test[1]:	T 59				
Residue by distillation, % by wt.		60	–	63	–
Oil portion of distillate, % by vol.		–	0.5	–	0.5
Test on residue from distillation:	T 49				
Penetration @ 77°F, dmm		55	95	120	–
Test on rejuvenating agent:					
BWOA, %[2]	***	–	–	2	–
Viscosity @ 140°F, cSt	T 201	–	–	50	175
Flash Point, COC, °F	T 48	–	–	380	–
Solubility in n-pentane, % by wt.	D2007	–	–	99	–

1. The temperature on the lower thermometer should be brought slowly to 350°F ±10°F and maintained at this temperature for 20 min. The total distillation should be completed in 60 ± 5 min. from the first application of heat.
2. BWOA = By weight of asphalt. Provide a manufacturer's certificate of analysis (COA) with the percent of rejuvenator added.

2.5. **Specialty Emulsions.** Provide specialty emulsion that is either asphalt-based or resin-based and meets the requirements of Table 11 or Table 11A.

Table 11
Specialty Emulsions

Property	Test Procedure	Type–Grade					
		Medium-Setting				Slow-Setting	
		AE-P		EAP&T		PCE[1]	
		Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol	T 72						
77°F, sec.		–	–	–	–	10	100
122°F, sec.		15	150	–	–	–	–
Sieve test, %	T 59	–	0.1	–	0.1	–	0.1
Miscibility[2]	T 59	–		Pass		Pass	
Demulsibility, 35 mL of 0.10 N $CaCl^2$, %	T 59	–	70	–	–	–	–
Storage stability, 1 day, %	T 59	–	1	–	1	–	–
Particle size,[5] % by volume < 2.5 μm	Tex-238-F[3]	–	–	90	–	90	–
Asphalt emulsion distillation to 500°F followed by Cutback asphalt distillation of residue to 680°F:	T 59 & T 78						
Residue after both distillations, % by wt.		40	–	–	–	–	–
Total oil distillate from both distillations, % by volume of emulsion		25	40	–	–	–	–
Residue by distillation, % by wt.	T 59	–	–	60	–	–	–
Residue by evaporation,[4] % by wt.	T 59	–	–	–	–	60	–
Tests on residue after all distillations:							
Viscosity, 140°F, poise	T 202	–	–	800	–	–	–
Kinematic viscosity,[5] 140°F, cSt	T 201	–	–	–	–	100	350
Flash point C.O.C., °F	T 48	–	–	–	–	400	–
Solubility in trichloroethylene, %	T 44	97.5	–	–	–	–	–
Float test, 122°F, sec.	T 50	50	200	–	–	–	–

1. Supply with each shipment of PCE:
   - a copy of a lab report from an approved analytical lab, signed by a lab official, indicating the PCE formulation does not meet any characteristics of a Resource Conservation Recovery Act (RCRA) hazardous waste;
   - a certification from the producer that the formulation supplied does not differ from the one tested and that no listed RCRA hazardous wastes or Polychlorinated Biphenyls (PCBs) have been mixed with the product; and
   - a Safety Data Sheet.
2. Exception to T 59: In dilution, use 350 mL of distilled or deionized water and a 1,000-mL beaker.
3. Use Tex-238-F, beginning at "Particle Size Analysis by Laser Diffraction," with distilled or deionized water as a medium and no dispersant, or use another approved method.
4. Exception to T 59: Leave sample in the oven until foaming ceases, then cool and weigh.
5. PCE must meet either the kinematic viscosity requirement or the particle size requirement.

Table 11A
Hard Residue Surface Sealant

Property	Test Procedure	Min	Max
Viscosity, Krebs unit, 77ºF, Krebs units	D 562	45	75
Softening point, ºF	Tex-505-C[1]	250	–
Uniformity	D 2939	Pass[2]	
Resistance to heat	D 2939	Pass[3]	
Resistance to water	D 2939	Pass[4]	
Wet flow, mm	D 2939	–	0
Resistance to Kerosene (optional)[5]	D 2939	Pass[6]	
Ultraviolet exposure, UVA-340, 0.77 W/m^2, 50°C chamber, 8 hr. UV lamp, 5 min. spray, 3 hr. 55 min. condensation, 1,000 hr. total exposure[7]	G 154	Pass[8]	
Abrasion loss, 1.6 mm thickness, liquid only, %	ISSA TB-100	–	1.0
Residue by evaporation, % by weight	D 2939	33	–
Tests on residue from evaporation: Penetration, 77ºF, 100 g, 5 sec. Flash point, Cleveland open cup, °F	 T 49 T 48	 15 500	 30
Tests on base asphalt before emulsification Solubility in trichloroethylene, %	 T 44	 98	 –

1. Cure the emulsion in the softening point ring in a 200°F ± 5°F oven for 2 hr.
2. Product must be homogenous and show no separation or coagulation that cannot be overcome by moderate stirring.
3. No sagging or slippage of film beyond the initial reference line.
4. No blistering or re-emulsification.
5. Recommended for airport applications or where fuel resistance is desired.
6. No absorption of Kerosene into the clay tile past the sealer film. Note sealer surface condition and loss of adhesion.
7. Other exposure cycles with similar levels of irradiation and conditions may be used with Department approval.
8. No cracking, chipping, surface distortion, or loss of adhesion. No color fading or lightening.

2.6. **Recycling Agent**. Recycling agent and emulsified recycling agent must meet the requirements in Table 12. Additionally, recycling agent and residue from emulsified recycling agent, when added in the specified proportions to the recycled asphalt, must meet the properties specified on the plans.

Table 12
Recycling Agent and Emulsified Recycling Agent

Property	Test Procedure	Recycling Agent		Emulsified Recycling Agent (ARA-1)		Polymer Modified Emulsified Recycling Agent (ARA-1P)	
		Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol, 77°F, sec.	T 72	–	–	15	100	15	110
Sieve test, %	T 59	–	–	–	0.1	–	0.1
Miscibility[1]	T 59	–		No coagulation			
Residue by evaporation,[2] % by wt.	T 59	–	–	60	–	–	–
Distillation test: Residue by distillation, % by wt. Oil distillate, % by volume of emulsion	T 59					 60 –	 65 2
Penetration of Distillation Residue at 39.2°F, 100 g, 5 sec.	T 49					110	190
Tests on recycling agent or residue from evaporation: Flash point, C.O.C., °F Kinematic viscosity, 140°F, cSt 275°F, cSt	 T 48 T 201	 400 75 –	 – 200 10.0	 400 75 –	 – 200 10.0	 400	 –

1. Exception to T 59: Use 0.02 N CaCl2 solution in place of water.
2. Exception to T 59: Maintain sample at 300°F until foaming ceases, then cool and weigh.

2.7. **Crumb Rubber Modifier**. Crumb rubber modifier (CRM) consists of automobile and truck tires processed by ambient temperature grinding.

CRM must be:

- free from contaminants including fabric, metal, and mineral and other nonrubber substances;
- free-flowing; and
- nonfoaming when added to hot asphalt binder.

Ensure rubber gradation meets the requirements of the grades in Table 13 when tested in accordance with Tex-200-F, Part I, using a 50-g sample.

Table 13
CRM Gradations

Sieve Size (% Passing)	Grade A		Grade B		Grade C		Grade D	Grade E
	Min	Max	Min	Max	Min	Max		
#8	100	–	–	–	–	–	As shown on the plans	As approved
#10	95	100	100	–	–	–		
#16	–	–	70	100	100	–		
#30	–	–	25	60	90	100		
#40	–	–	–	–	45	100		
#50	0	10	–	–	–	–		
#200	–	–	0	5	–	–		

2.8. **Crack Sealer**. Provide polymer-modified asphalt-emulsion crack sealer meeting the requirements of Table 14. Provide rubber-asphalt crack sealer meeting the requirements of Table 15.

Table 14
Polymer-Modified Asphalt-Emulsion Crack Sealer

Property	Test Procedure	Min	Max
Rotational viscosity, 77°F, cP	D 2196, Method A	10,000	25,000
Sieve test, %	T 59	–	0.1
Storage stability, 1 day, %	T 59	–	1
Evaporation Residue by evaporation, % by wt.	Tex-543-C	65	–
Tests on residue from evaporation: Penetration, 77°F, 100 g, 5 sec. Softening point, °F Ductility, 39.2°F, 5 cm/min., cm	 T 49 T 53 T 51	 35 140 100	 75 – –

Table 15
Rubber-Asphalt Crack Sealer

Property	Test Procedure	Class A		Class B	
		Min	Max	Min	Max
CRM content, Grade A or B, % by wt.	Tex-544-C	22	26	–	–
CRM content, Grade B, % by wt.	Tex-544-C	–	–	13	17
Virgin rubber content,[1] % by wt.		–	–	2	–
Flash point,[2] C.O.C., °F	T 48	400	–	400	–
Penetration,[3] 77°F, 150 g, 5 sec.	T 49	30	50	30	50
Penetration,[3] 32°F, 200 g, 60 sec.	T 49	12	–	12	–
Softening point, °F	T 53	–	–	170	–
Bond Test, non-immersed, 0.5 in specimen, 50% extension, 20°F[4]	D5329	–		Pass	

1. Provide certification that the Min % virgin rubber was added.
2. Agitate the sealing compound with a 3/8- to 1/2 in. (9.5- to 12.7 mm) wide, square-end metal spatula to bring the material on the bottom of the cup to the surface (i.e., turn the material over) before passing the test flame over the cup. Start at one side of the thermometer, move around to the other, and then return to the starting point using 8 to 10 rapid circular strokes. Accomplish agitation in 3 to 4 sec. Pass the test flame over the cup immediately after stirring is completed.
3. Exception to T 49: Substitute the cone specified in D 217 for the penetration needle.
4. Allow no crack in the crack sealing materials or break in the bond between the sealer and the mortar blocks over 1/4 in. deep for any specimen after completion of the test.

2.9. **Asphalt-Rubber Binders**. Provide asphalt-rubber (A-R) binders that are mixtures of asphalt binder and CRM, which have been reacted at elevated temperatures. Provide A-R binders meeting D6114 and containing a minimum of 15% CRM by weight. Provide Types I or II, containing CRM Grade C, for use in hot-mixed aggregate mixtures. Provide Types II or III, containing CRM Grade B, for use in surface treatment binder. Ensure binder properties meet the requirements of Table 16.

Table 16
A-R Binders

Property	Test Procedure	Binder Type					
		Type I		Type II		Type III	
		Min	Max	Min	Max	Min	Max
Apparent viscosity, 347°F, cP	D2196, Method A	1,500	5,000	1,500	5,000	1,500	5,000
Penetration, 77°F, 100 g, 5 sec.	T 49	25	75	25	75	50	100
Penetration, 39.2°F, 200 g, 60 sec.	T 49	10	–	15	–	25	–
Softening point, °F	T 53	135	–	130	–	125	–
Resilience, 77°F, %	D5329	25	–	20	–	10	–
Flash point, C.O.C., °F	T 48	450	–	450	–	450	–
Tests on residue from Thin-Film Oven Test: Retained penetration ratio, 39.2°F, 200 g, 60 sec., % of original	T 179 T 49	75	–	75	–	75	–

2.10. **Performance-Graded Binders**. Provide PG binders that are smooth and homogeneous, show no separation when tested in accordance with Tex-540-C, and meet the requirements of Table 17.

Separation testing is not required if:

- a modifier is introduced separately at the mix plant either by injection in the asphalt line or mixer,
- the binder is blended on site in continuously agitated tanks, or
- binder acceptance is based on field samples taken from an in-line sampling port at the hot-mix plant after the addition of modifiers.

Table 17
Performance-Graded Binders

Property and Test Method	Performance Grade																		
	PG 58			PG 64				PG 70				PG 76				PG 82			
	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	
Average 7-day max pavement design temperature, °C[1]	58			64				70				76				82			
Min pavement design temperature, °C[1]	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	
Original Binder																			
Flash point, T 48, Min, °C	230																		
Viscosity, T 316[2, 3]: Max, 3.0 Pa·s, test temperature, °C	135																		
Dynamic shear, T 315[4]: G*/sin(δ), Min, 1.00 kPa, Max, 2.00 kPa[7], Test temperature @ 10 rad/sec., °C	58			64				70				76				82			
Elastic recovery, D6084, 50°F, % Min[8]	–	–	30	–	–	30	50	–	30	50	60	30	50	60	70	50	60	70	
Rolling Thin-Film Oven (Tex-506-C)																			
Mass change, T 240, Max, %	1.0																		
Dynamic shear, T 315: G*/sin(δ), Min, 2.20 kPa, Max, 5.00 kPa[7], Test temperature @ 10 rad/sec., °C	58			64				70				76				82			
MSCR, T350, Recovery, 0.1 kPa, High Temperature, % Min[8]	–	–	20	–	–	20	30	–	20	30	40	20	30	40	50	30	40	50	
Pressure Aging Vessel (PAV) Residue (R 28)																			
PAV aging temperature, °C	100																		
Dynamic shear, T 315: G*sin(δ), Max, 5,000 kPa Test temperature @ 10 rad/sec., °C	25	22	19	28	25	22	19	28	25	22	19	28	25	22	19	28	25	22	
Creep stiffness, T 313[5, 6]: *S*, max, 300 MPa, *m*-value, Min, 0.300 Test temperature @ 60 sec., °C	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	
Direct tension, T 314[6]: Failure strain, min, 1.0% Test temperature @ 1.0 mm/min., °C	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	

1. Pavement temperatures are estimated from air temperatures and using an algorithm contained in a Department-supplied computer program, may be provided by the Department, or by following the procedures outlined in AASHTO MP 2 and PP 28.
2. This requirement may be waived at the Department's discretion if the supplier warrants that the asphalt binder can be adequately pumped, mixed, and compacted at temperatures that meet all applicable safety, environmental, and constructability requirements. At test temperatures where the binder is a Newtonian fluid, any suitable standard means of viscosity measurement may be used, including capillary (T 201 or T 202) or rotational viscometry (T 316).
3. Viscosity at 135°C is an indicator of mixing and compaction temperatures that can be expected in the lab and field. High values may indicate high mixing and compaction temperatures. Additionally, significant variation can occur from batch to batch. Contractors should be aware that variation could significantly impact their mixing and compaction operations. Contractors are therefore responsible for addressing any constructability issues that may arise.
4. For quality control of unmodified asphalt binder production, measurement of the viscosity of the original asphalt binder may be substituted for dynamic shear measurements of G*/sin(δ) at test temperatures where the asphalt is a Newtonian fluid. Any suitable standard means of viscosity measurement may be used, including capillary (T 201 or T 202) or rotational viscometry (T 316).
5. Silicone beam molds, as described in AASHTO TP 1-93, are acceptable for use.
6. If creep stiffness is below 300 MPa, direct tension test is not required. If creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used instead of the creep stiffness requirement. The m value requirement must be satisfied in both cases.
7. Maximum values for unaged and RTFO aged dynamic shear apply only to materials used as substitute binders, as described in Item 340, "Dense-Graded Hot-Mix Asphalt (Small Quantity)", Item 341, "Dense-Graded Hot-Mix Asphalt, and Item 344, "Superpave Mixtures."
8. Elastic Recovery (ASTM D6084) is not required unless MSCR (AASHTO T 350) is less than the minimum % recovery. Elastic Recovery must be used for the acceptance criteria in this instance.

3. EQUIPMENT

Provide all equipment necessary to transport, store, sample, heat, apply, and incorporate asphalts, oils, and emulsions.

4. CONSTRUCTION

Typical Material Use. Use materials shown in Table 18, unless otherwise determined by the Engineer.

Table18
Typical Material Use

Material Application	Typically Used Materials
Hot-mixed, hot-laid asphalt mixtures	PG binders, A-R binders Types I and II
Surface treatment	AC-5, AC-10, AC-15P, AC-20XP, AC-10-2TR, AC-20-5TR, HFRS-2, MS-2, CRS-2, CRS-2H, CRS-2TR, CMS-2P HFRS-2P, CRS-2P, CHFRS-2P, A-R binders Types II and III
Surface treatment (cool weather)	AC12-5TR, RC-250, RC-800, RC-3000, MC-250, MC-800, MC-3000, MC-2400L, CMS-2P
Precoating	AC-5, AC-10, PG 64-22, SS-1, SS-1H, CSS-1, CSS-1H
Tack coat	PG Binders, SS-1H, CSS-1H, EAP&T, TRAIL, EBL
Fog seal	SS-1, SS-1H, CSS-1, CSS-1H, CMS-1P
Hot-mixed, cold-laid asphalt mixtures	AC-0.6, AC-1.5, AC-3, AES-300, AES-300P, CMS-2, CMS-2S
Patching mix	MC-800, SCM I, SCM II, AES-300S
Recycling	AC-0.6, AC-1.5, AC-3, AES-150P, AES-300P, recycling agent, emulsified recycling agent
Crack sealing	SS-1P, polymer mod AE crack sealant, rubber asphalt crack sealers (Class A, Class B)
Microsurfacing	CSS-1P
Prime	MC-30, AE-P, EAP&T, PCE
Curing membrane	SS-1, SS-1H, CSS-1, CSS-1H, PCE
Erosion control	SS-1, SS-1H, CSS-1, CSS-1H, PCE
FDR -Foaming	PG 64-22, FDR EM-SY, FDR EM-HY

4.1. **Storage and Application Temperatures**. Use storage and application temperatures in accordance with Table 19. Store and apply materials at the lowest temperature yielding satisfactory results. Follow the manufacturer's instructions for any agitation requirements in storage. Manufacturer's instructions regarding recommended application and storage temperatures supersede those of Table 19.

Table19
Storage and Application Temperatures

Type-Grade	Application		Storage Max (°F)
	Recommended Range (°F)	Max Allowable (°F)	
AC-0.6, AC-1.5, AC-3	200–300	350	350
AC-5, AC-10	275–350	350	350
AC-15P, AC-20-5TR, AC12-5TR and AC10-2TR	300–375	375	360
RC-250	125–180	200	200
RC-800	170–230	260	260
RC-3000	215–275	285	285
MC-30, AE-P	70–150	175	175
MC-250	125–210	240	240
MC-800, SCM I, SCM II	175–260	275	275
MC-3000, MC-2400L	225–275	290	290
HFRS-2, MS-2, CRS-2, CRS-2H, HFRS-2P, CRS-2P, CMS-2, CMS-2S, AES-300, AES-300S, AES-150P, AES-300P, CRS-2TR	120–160	180	180
SS-1, SS-1H, CSS-1, CSS-1H, PCE, EAP&T, SS-1P, RS-1P, CRS-1P, CSS-1P, recycling agent, emulsified recycling agent, polymer mod AE crack sealant	50–130	140	140
PG binders	275–350	350	350
Rubber asphalt crack sealers (Class A, Class B)	350–375	400	–
A-R binders Types I, II, and III	325–425	425	425

5. MEASUREMENT AND PAYMENT

The work performed, materials furnished, equipment, labor, tools, and incidentals will not be measured or paid for directly but is subsidiary or is included in payment for other pertinent Items.

Special Specification 5062
Patching Milled Concrete Rumble Strips

1. DESCRIPTION

This Item governs the patching milled concrete rumble strips. It includes cleaning, priming, and patching the milled groove for rumble strips on concrete pavement. It includes furnishing the patching materials.

2. MATERIALS

Provide polymeric patching material that meets material requirements of DMS-6170, "Polymeric Materials for Patching Spalls in Concrete Pavement", Type II Material, and matches the color of the pavement. The patching material must also meet the following minimum performance requirements:

- Compressive Strength at 24 Hours (ASTM C 579, Method B): 4500 PSI
- Must be able to carry traffic within 3 hours of placement

3. WORK METHODS

Submit for approval product specifications, product data sheets, and installation instructions from the manufacturer to the Engineer prior to beginning work. Clean and prepare area to receive patching material in accordance with manufacturer's specified instructions. Dry and abrasive blast the repair area to ensure it is free from moisture, dirt, grease, oil, or other foreign material that may reduce the bond. Remove dust from the abrasive blasting operation. Apply duct tape in a symmetrical manner at the perimeter of rumble strips to obtain a uniform appearance. Apply primer to surface where patching material is to be placed, in accordance with manufacturer's recommendations. Reapply primer if conditions change before placing patching material. Mix, place, and cure material in accordance with manufacturer's recommendations. Begin placement of material at the lower end of sloped areas. Screed polymeric patching material to conform to the roadway surface. Provide a non-skid finish with a notched trowel.

4. MEASUREMENT

This item will be measured by the linear foot. Measurement will be along each edge of roadway that is to be patched.

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 "Patching Milled Concrete Rumble Strips". This price is full compensation for surface preparation, priming, and patching milled concrete rumble strips; for furnishing and placing all materials; for disposal of all materials removed; for additional material that may be required due to spalled grooves and for all labor, tools, equipment and incidentals necessary to complete the work.

Special Specification 6001
Portable Changeable Message Sign

1. DESCRIPTION

Furnish, operate, and maintain portable trailer mounted changeable message sign (PCMS) units.

2. MATERIALS

Furnish new or used material in accordance with the requirements of this Item and the details shown on the plans. Provide a self-contained PCMS unit with the following:

- Sign controller
- Changeable Message Sign
- Trailer
- Power source

Paint the exterior surfaces of the power supply housing, supports, trailer, and sign with Federal Orange No. 22246 or Federal Yellow No. 13538 of Federal Standard 595C, except paint the sign face assembly flat black.

2.1. **Sign Controller**. Provide a controller with permanent storage of a minimum of 75 pre-programmed messages. Provide an external input device for random programming and storage of a minimum of 75 additional messages. Provide a controller capable of displaying up to 3 messages sequentially. Provide a controller with adjustable display rates. Enclose sign controller equipment in a lockable enclosure.

2.2. **Changeable Message Sign**. Provide a sign capable of being elevated to at least 7 ft. above the roadway surface from the bottom of the sign. Provide a sign capable of being rotated 360° and secured against movement in any position.

Provide a sign with 3 separate lines of text and 8 characters per line minimum. Provide a minimum 18 in. character height. Provide a 5 × 7 character pixel matrix. Provide a message legibility distance of 600 ft. for nighttime conditions and 800 ft. for normal daylight conditions. Provide for manual and automatic dimming light sources.

The following are descriptions for 3 screen types of PCMS:

- **Character Modular Matrix**. This screen type comprises of character blocks.
- **Continuous Line Matrix**. This screen type uses proportionally spaced fonts for each line of text.
- **Full Matrix**. This screen type uses proportionally spaced fonts, varies the height of characters, and displays simple graphics on the entire sign.

2.3. **Trailer**. Provide a 2 wheel trailer with square top fenders, 4 leveling jacks, and trailer lights. Do not exceed an overall trailer width of 96 in. Shock mount the electronics and sign assembly.

2.4. **Power Source**. Provide a diesel generator, solar powered power source, or both. Provide a backup power source as necessary.

2.5. **Cellular Telephone**. When shown on the plans, provide a cellular telephone connection to communicate with the PCMS unit remotely.

3. CONSTRUCTION

Place or relocate PCMS units as shown on the plans or as directed. The plans will show the number of PCMS units needed, for how many days, and for which construction phases.

Maintain the PCMS units in good working condition. Repair damaged or malfunctioning PCMS units as soon as possible. PCMS units will remain the property of the Contractor.

4. MEASUREMENT

This Item will be measured by each PCMS or by the day used. All PCMS units must be set up on a work area and operational before a calendar day can be considered measurable. When measurement by the day is specified, a day will be measured for each PCMS set up and operational on the worksite.

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 "Portable Changeable Message Sign." This price is full compensation for PCMS units; set up; relocating; removing; replacement parts; batteries (when required); fuel, oil, and oil filters (when required); cellular telephone charges (when required); software; and equipment, materials, tools, labor, and incidentals.

Special Specification 6019

Longitudinal Prefabricated Pavement Markings (PPM) with Warranty

1. DESCRIPTION

Furnish and place longitudinal PPM as shown on the plans. Provide a manufacturer's warranty bond for a 6 year period. The Department will allow a Contractor provided warranty bond instead of the manufacturer's bond if all conditions of the manufacturer's warranty, including the requirements of this Item, are met. In such case, the Contractor is responsible for meeting the warranty requirements. Use the form provided by the Department. The Department will allow substitution of a contractor's bond with a manufacturer's bond after execution of the Contract before final acceptance.

2. MATERIALS

Use pavement markings that meet the requirements of Type B in DMS-8240, "Permanent Prefabricated Pavement Markings," and that are shown on the Department's MPL.

3. EQUIPMENT

Provide equipment as required or directed according to the following: (The provider of the warranty bond is responsible for providing equipment during the warranty period unless otherwise shown on the plans.)

3.1. **Preparation and Application**. Use equipment designed for the pavement preparation and application of the type of PPM material selected.

3.2. **Colorimeter**. Provide a colorimeter using 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle meeting the requirements of ASTM E1347, E1348, or E1349.

3.3. **Retroreflectometer**. Unless otherwise shown on the plans, provide a portable or mobile retroreflectometer meeting the following requirements.

3.3.1. **Portable Retroreflectometer**. Provide a portable retroreflectometer that meets the requirements of ASTM E1710.

3.3.2. **Mobile Retroreflectometer**. Provide a mobile retroreflectometer that:

- is approved by the Construction Division (CST) and certified by the Texas Transportation Institute Mobile Retroreflectometer Certification Program for project evaluation of retroreflectivity
- is calibrated daily, before measuring retroreflectivity on any pavement stripe, with a portable retroreflectometer meeting the following requirements: ASTM E1710, entrance angle of 88.76°, observation angle of 1.05°, and an accuracy of ±15%; and
- requires no traffic control when retroreflectivity measurements are taken and is capable of taking continuous readings at or near posted speeds

Furnish mobile retroreflectivity measurements in compliance with Special Specification, "Mobile Retroreflectivity Data Collection for Pavement Markings," unless otherwise approved by the Engineer. The Engineer may require an occasional field comparison check with a portable retroreflectometer meeting the requirements listed above to ensure accuracy.

4. CONSTRUCTION

4.1. **General**. Prepare the pavement surface using controlled techniques that minimize pavement damage and hazards to the traveling public. Apply the PPM materials according to the manufacturer's recommendations, using widths, colors, and shapes at locations as shown on the plans.

Obtain approval for the sequence of work and estimated daily production. Use traffic control as shown on the plans or as approved. Establish guides to mark the lateral location of pavement markings as shown on the plans or as directed, and have guide locations verified. Use material for guides that will not leave a permanent mark on the roadway. Apply markings in alignment with the guides and without deviating for the alignment more than 1 in. per 200 ft. of roadway or more than 2 in. maximum. Remove all applied markings that are not in alignment or sequence as stated in the plans or as stated in the specifications at the Contractor's expense and in accordance with Item 677, "Eliminating Existing Pavement Markings and Markers," except for measurement and payment.

4.2. **Initial Performance Requirements**. Meet Article 5, "Performance Requirements" initially, after installation.

The Engineer will conduct visual performance evaluations of PPM. For markings that do not meet the Engineer's visual performance evaluation, the Contractor may present test results for color (using a colorimeter), retroreflectivity (using a retroreflectometer in accordance with this Item), and durability (in accordance with ASTM D913) for the Engineer's use in making acceptance or rejection decisions.

For PPM not meeting performance requirements, repair or replace until reevaluation shows the PPM meet the performance requirements as approved by the Engineer.

4.3. **Written Acceptance**. The Department will provide written acceptance after the Contractor meets the initial performance requirements. This written acceptance (see attached sample form) will include the date, location, length, and type of PPM.

5. PERFORMANCE REQUIREMENTS

5.1. **Color**. Provide PPM consisting of pigments blended to provide color conforming to highway colors as shown in Table 1.

Table 1
Color Requirements

Federal 595 Color		Chromaticity Coordinates								Brightness (Y)
		1		2		3		4		
		x	y	x	y	X	y	x	y	
White	17855	.290	.315	.310	.295	.350	.340	.330	.360	60 Min
Yellow	33538	.470	.455	.510	.489	.490	.432	.537	.462	30 Min
Black										5 Max

5.2. **Retroreflectivity**. Provide PPM for longitudinal markings meeting the minimum retroreflectivity values listed in Table 2.

Table 2
Minimum Retroreflectivity Requirements

Color	Retroreflectivity, $mcd/m^2/lx$, Min
White	120
Yellow	120

5.3. **Durability**. Provide PPM that do not lose more than 5% of the striping material in a 1,000-ft. section of continuous stripe or broken stripe (25 broken stripes). Pavement markings must remain in the proper alignment and location.

5.4. **Performance Evaluation Procedures**. Provide traffic control and conduct evaluations of color, retroreflectivity, and durability as required or directed.

5.4.1. **Color**. Measure color using 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle in accordance with ASTM E 1347, E 1348, or E 1349.

5.4.2. **Retroreflectivity**. Unless otherwise shown on the plans, conduct retroreflectivity evaluations of pavement markings with either a portable or mobile retroreflectometer. Make all measurements in the direction of traffic flow, except for broken centerline on 2-way roadways, where measurements will be made in both directions.

If using a portable retroreflectometer, take a minimum of 1 measurement every mile on each series of markings (i.e., edgeline, center skipline, each line of a double line, etc.), at locations approved by the Engineer. If more than 1 measurement is taken, average the measurements. For all markings measured in both directions, take a minimum of 1 measurement in each direction. If the measurement taken on a specific series of markings within each mile segment falls below the minimum retroreflectivity values, take a minimum of 5 more measurements at locations determined by the Engineer within that mile segment for that series of marking. If the average of these 5 measurements falls below the minimum retroreflectivity requirements, that mile segment of the applied markings does not meet the performance requirement.

If using a mobile retroreflectometer, review the results to determine deficient sections and deficient areas of interest. These areas do not meet the performance requirements.

5.4.3. **Durability**. Measure durability in accordance with ASTM D913 for marking material loss and visual inspection for alignment and location. Conduct evaluations at locations approved by the Engineer.

6. WARRANTY REQUIREMENTS

Each warranty period is for 6 yr. and starts the day after written acceptance.

The marking warrantor is responsible for meeting Article 5, “Performance Requirements,” for the duration of the warranty period.

During the warranty period, the Engineer will conduct periodic visual performance evaluations of PPM. For retroreflectivity the Engineer will use Tex-828-B, “Determining Functional Characteristics of Pavement Markings.” The warrantor may be present during these evaluations. For areas, which, in the opinion of the Engineer, have a questionable visual evaluation, the warrantor may replace the PPM or may conduct a performance evaluation for the performance requirement in question, according to Section 5.4., “Performance Evaluation Procedures.” Conduct retroreflectivity evaluations according to Section 5.4.2., “Retroreflectivity,” using either portable or mobile retroreflectometer unless otherwise shown on the plans. The warrantor is responsible for traffic control when conducting performance evaluations.

The warrantor will replace PPM that fails to meet the color, retroreflectivity, or durability performance requirements during the warranty period. Replace PPM that fails to meet the performance requirements within 30 days of notification.

All replacement PPM must meet the materials and performance requirements of this specification, under the following conditions to complete the warranty period:

If the longitudinal PPM fails to meet the performance requirements in Article 5 in Years 1 through 4, use materials meeting Type B requirements of specification DMS-8240.

If the longitudinal PPM fails to meet the performance requirements in Article 5 in Years 5 or 6, use materials that meet DMS-8240 (Type A or B), or on the Department’s MPL, to meet the performance requirements of Article 5.

The end of the warranty period does not relieve the warrantor from the performance deficiencies requiring corrective action identified during the warranty period.

The Engineer may exclude PPM from the replacement provisions of the warranty period, provided the Engineer determines that the failure is a result of outside causes rather than defective material. Examples of outside causes are extreme wear at intersections, damage by snow or ice removal, and premature pavement failure.

Provide a contact person, address and telephone number for notification of needed PPM replacement.

7. MEASUREMENT

This Item will be measured by the foot or by any other unit shown on the plans. Each stripe will be measured separately.

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.

8. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Longitudinal Prefabricated Pavement Markings (PPM) with Warranty" of the color, shape and width, specified as applicable, at the time of project acceptance. This price is full compensation for materials, application of longitudinal PPM, testing, warranty work, equipment, labor, tools, and incidentals.

WMS INSTALLATION RECORD FOR WRITTEN ACCEPTANCE

** Warranty period begins the day after written acceptance.

COUNTY HIGHWAY	CONTROL PROJECT	LIMITS FROM LIMITS TO	LENGTH	TYPE PPM	ACCEPTANCE DATE

Contractor Signature _____ Date _____

Department Signature _____ Date _____

WARRANTY BOND		CONTRACT NO.	
		COUNTY	
		BOND NO	

KNOW ALL PERSONS BY THESE PRESENTS: That we, _ _____, manufacturer of or Contractor for prefabricated pavement markings, as Principal, and _ _____, as Surety, are held and firmly bound unto the State of Texas, as Obligee, in the penal sum of _ _____ __Dollars **$**_ _____, lawful money of the United States, well and truly to be paid to the State of Texas, and we bind ourselves, our heirs, successors, executors, and administrators jointly and severally, firmly by these presents.

Whereas, the above bounden Principal has provided prefabricated pavement markings to _ _____for the foregoing contract entered into between _ _____ and the Obligee, attached hereto; and

Whereas, the Principal is required to protect the Obligee against any defects resulting from faulty prefabricated pavement markings installed under said contract for a period of 6 years beginning the day after written acceptance.

Now, therefore, the condition of this obligation is such that if the above bounden principal, its heirs, successors, executors, and administrators shall promptly and faithfully carry out and perform the warranty as provided in said contract, and shall, within thirty days of due notice, replace any installed prefabricated pavement markings that may fail to meet Obligee's performance evaluation as provided for in the Contract during the period specified above or shall pay over, make good, and reimburse to the said Obligee all loss and damage that said Obligee may sustain by reason of failure or default of said Principal so to do, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

Provided further that the end of a warranty period shall not relieve Principal from its obligation to correct deficiencies requiring corrective action, so long as those deficiencies are identified during the warranty period.

WITNESS our hand this _____ day of _____ 20 _____

_____
(Warrantor Name)

_____ * By: _____
****SURETY** (Print Firm Name and Seal) (Warrantor Officer)

* By: _____ * By: _____
(Title) (Warrantor Officer)

_____ _____
****SURETY** (Print Firm Name and Seal) ****SURETY** (Print Firm Name and Seal)

* By: _____ * By: _____
(Title) (Title)

Note:
* Attach a Power of Attorney showing that the officer of the installing contractor has authority to sign this obligation.
** Attach a Power of Attorney showing that the surety officer or Attorney-In-Fact has authority to sign this obligation; the Power of Attorney and bond must be impressed with the corporate seal. The surety must be a US Treasury listed company and provide notification information.

Special Specification 6027

Preparation of Existing Conduits, Ground Boxes, or Manholes

1. DESCRIPTION

Prepare conduits, ground boxes, or manholes; replace conduits, ground boxes, or manholes, when necessary; replace conduit fittings with junction boxes; replace damaged ground box or manholes covers; adjust ground box or manholes covers; install pull lines in conduits; install cable racks in ground boxes or manholes.

2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and to the pertinent requirements of the following Items:

- Item 624, “Ground Boxes”
- Item 465, “Manholes and Inlets”

When conduit replacement is required, provide conduit meeting the requirements of Item 618, “Conduit.” Use conduit of same size and type of that being replaced or as directed.

Provide 24 in. × 24 in. × 12 in. (L × W × D) minimum size NEMA 4X junction boxes with screw covers.

Provide polyester tapes or rope pull cords with a tensile strength of at least 1200 lb.

Provide heavy duty, non-metallic, non-corrosive cable racks that can support a minimum dead load of 300 lbs. 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 conduit and ground boxes.

3.1. **Preparation of Conduit, Ground Box or Manhole**. Pull a mandrel through empty conduits. Use a mandrel with a diameter greater than 70% of the inside diameter of the conduit and 2 in. length. Repair or replace conduit runs that will not allow passage of the mandrel. Replace conduit deemed impractical to repair or remains unsuitable in accordance with Item 618, “Conduit.” Clean the conduit by pulling a rubber swab slightly larger in diameter than the conduit.

Blow compressed air through conduits that contain wires. Remove debris from the conduit by pushing a fish tape through the conduit. Do not use water to clear debris. Retest the conduit by blowing compressed air.

Install 1 pull cord in each conduit for use in installing the conductors, cables, or innerduct. Leave 1 pull cord in each conduit after the conductors, cables, or innerduct have been installed.

Remove silt and debris from ground boxes or manholes prior to 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 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, 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 2 cable rack supports and 4 adjustable levels on each support, at a minimum, on each wall of the ground box or manhole as shown on 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 pull out strength of at least 2500 lb. and ultimate shear strength of at least 3000 lb. Provide sufficient cable supports for the particular number of conductors or cables coiled or passing through the ground box or manhole as shown on the plans or as directed.

4. MEASUREMENT

This Item will be measured by the foot of conduit cleared, tested, replaced and repaired, by each cable rack, junction box, ground box, or manhole installed or prepared, and by each ground box or manhole cover replaced or 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 “Conduit (Prepare),” “Junction Box (Install),” “Manhole (Install),” “Ground Box (Install),” “Manhole (Prepare),” “Ground Box (Prepare),” “Cover (Replace)” of the sizes specified, “Cover (Adjust),” and “Cable Rack Assembly (Install).” This price is full compensation for cleaning and testing conduit, ground boxes, and manholes; furnishing and installing pull cords, ground boxes, manholes, junction boxes, and cable racks; excavating and backfilling; adjusting ground boxes and manholes covers; disposal of unsalvageable material; and equipment, materials, labor, tools, and incidentals.

Repair of existing conduit will be paid for by the Department in accordance with Article 9.7., “Payment for Extra Work and Force Account Method.”

Special Specification 6038
Multipolymer Pavement Markings (MPM)

1. DESCRIPTION

Provide MPM on pavement surfaces shown on the plans to meet the performance requirements of this Specification for:

- color,
- durability, and
- retroreflectivity.

2. MATERIALS

2.1. **Multipolymer Pavement Marking Materials.** Use materials that produce an adherent, retroreflective pavement marking system that meets all of the performance requirements of this Specification. Use materials that do not result in the generation of any hazardous materials/wastes, as defined in Section 1.3.60., "Hazardous Materials or Waste," during application or removal. If requested, provide a laboratory report from a commercial laboratory indicating material used does not result in the generation of any hazardous materials/wastes, as defined in Section 1.3.60., during application or removal.

Use a multipolymer resin material, which is:

- 2-component (a predominantly multipolymer pigmented resin component with a curing agent component);
- 100% solids, producing no toxic fumes when heated to application temperature;
- track-free in less than 40 min. with appropriate ambient temperature as recommended by the manufacturer;
- formulated and tested to perform as a pavement marking material with glass spheres applied to the surface; and
- on the Material Producer List for Pavement Markings (Multipolymer) maintained by CST/M&P for MPM. Inclusion onto the MPL requires documentation of acceptable performance from Department pavement marking field application that have been in place for at least 1 yr. Contact CST/M&P to initiate and document field trials of new materials for MPL consideration.

Before work begins, provide a laboratory report from an independent testing laboratory showing that the initial color of each material selected for use conforms to the color limits set forth in Table 1, measured by 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle in accordance with ASTM E 1347, E 1348, or E 1349.

2.2. **Nonreflectorized Contrast or Shadow Markings.** The marking material used for the contrast or shadow marking must conform to the same formulation, material, prequalification, and sampling requirements with the exception of the following items:

- color pigment used;
- documentation of acceptable performance from Department pavement marking field application that have been in place for at least 1 yr.; and
- glass spheres must be replaced with a black, color-fast, anti-skid material.

Before work begins, provide a laboratory report from an independent testing laboratory showing that the initial color of each material selected for use conforms to the color limits set forth in Table 1, measured by

45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle in accordance with ASTM E 1347, E 1348, or E 1349.

3. EQUIPMENT

Provide equipment as required or directed according to the following:

3.1. **Preparation and Application**. Use equipment designed for the pavement preparation and application of the type of MPM material selected.

3.2. **Colorimeter.** Provide a colorimeter using 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle meeting the requirements of ASTM E 1347, E 1348, or E 1349.

3.3. **Retroreflectometer.** Unless otherwise shown on the plans, provide a portable or mobile retroreflectometer meeting the following requirements.

3.3.1. **Portable Retroreflectometer.** Provide a portable retroreflectometer that meets the requirements of ASTM E 1710.

3.3.2. **Mobile Retroreflectometer.** Provide a mobile retroreflectometer that:

- is approved by the Construction Division (CST) for project evaluation of retroreflectivity, which will include taking a set of readings on stripes designated by CST and comparing them with the readings of a portable retroreflectometer provided by CST that meets the specifications indicated in this Specification;
- is calibrated daily, before measuring retroreflectivity on any pavement stripe, with a portable retroreflectometer meeting the following requirements: ASTM E 1710, entrance angle of 88.76°, observation angle of 1.05°, and an accuracy of ±15%;
- requires no traffic control when retroreflectivity measurements are taken and is capable of taking continuous readings; and
- documents mobile retroreflectometer evaluations, showing average retroreflectivity values for each 0.25-mi. section, or the area of concern if it is less than 0.25 mi., with all deficient sections clearly marked.

4. CONSTRUCTION

4.1. **General.** Prepare the pavement surface using controlled techniques that minimize pavement damage and hazards to the traveling public. Apply the MPM materials according to the manufacturer's recommendations using widths, colors, and shapes, and at locations as shown on the plans.

Obtain approval for the sequence of work and estimated daily production. Use traffic control as shown on the plans or as approved. Establish guides to mark the lateral location of pavement markings as shown on the plans or as directed, and have guide locations verified. Use material for guides that will not leave a permanent mark on the roadway. Apply markings in alignment with the guides and without deviating for the alignment more than 1 in. per 200 ft. of roadway or more than 2 in. maximum. Remove all applied markings that are not in alignment or sequence as stated in the plans or as stated in the specifications at the Contractor's expense and in accordance with Item 677, "Eliminating Existing Pavement Markings and Markers," except for measurement and payment.

4.2. **Initial Performance Requirements.** Meet the following initial performance requirements after installation. Perform an initial performance evaluation from 7 to 15 days after MPM are installed to verify that the MPM meet the performance requirements for retroreflectivity. Conduct initial retroreflectivity evaluations of placed pavement markings with either a portable or a mobile retroreflectometer, unless otherwise shown on the plans, according to Section 6038.5.2., "Retroreflectivity." The Contractor is responsible for traffic control when conducting performance evaluations.

The Engineer will conduct a visual evaluation for color and durability and require testing only if MPM do not appear to meet the performance requirements.

For MPM not meeting performance requirements, repair or replace until re-evaluation shows the MPM meet the performance requirements.

4.2.1. **Color.** Provide MPM consisting of pigments blended to provide color conforming to standard highway colors as shown in Table 1.

Table1
Color Requirements

Federal 595 Color		Chromaticity Coordinates								Brightness (Y)
		1		2		3		4		
		x	y	x	y	x	y	x	y	
White	17855	.290	.315	.310	.295	.350	.340	.330	.360	60 Min
Yellow	33538	.470	.455	.510	.489	.490	.432	.537	.462	30 Min
Black	-	-	-	-	-	-	-	-	-	5 Max

4.2.2. **Retroreflectivity.** Provide MPM meeting the minimum retroreflectivity values listed in Table 2.

Table2
Minimum Retroreflectivity Requirements

Color	Retroreflectivity, mcd/m^2/lx, Min
White	250
Yellow	175

4.2.3. **Durability.** Provide MPM that do not lose more than 5% of the striping material in a 1,000-ft. section of continuous stripe or broken stripe (25 broken stripes). Pavement markings must remain in the proper alignment and location.

5. PERFORMANCE EVALUATIONS

Provide traffic control and conduct evaluations of color, retroreflectivity, and durability as required or directed.

5.1. **Color.** Measure the color using 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle in accordance with ASTM E 1347, E 1348, or E 1349.

5.2. **Retroreflectivity.** Unless otherwise shown on the plans, conduct retroreflectivity evaluations of pavement markings with either a portable or a mobile retroreflectometer. Make all measurements in the direction of traffic flow, except for broken centerline on 2-way roadways, where measurements will be made in both directions.

If using a portable retroreflectometer, take a minimum of 1 measurement every mile on each series of markings (i.e., edgeline, center skip line, each line of a double line, etc.), at approved locations. If more than 1 measurement is taken, average the measurements. For all markings measured in both directions, take a minimum of 1 measurement in each direction. If the measurement taken on a specific series of markings within each mile segment falls below the minimum retroreflectivity values, take a minimum of 5 more measurements within that mile segment for that series of marking. If the average of these 5 measurements falls below the minimum retroreflectivity requirements, that mile segment of the applied markings does not meet the performance requirement.

If using a mobile retroreflectometer, review the results to determine deficient sections and deficient areas of interest. These areas do not meet the performance requirements.

5.3. **Durability.** Measure the durability in accordance with ASTM D 913 for marking material loss and visual inspection for alignment and location. Conduct evaluations at approved locations.

6. MEASUREMENT

This Item will be measured by the foot. Each stripe will be measured separately.

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.

7. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Multipolymer Pavement Markings (MPM)" of the type and color specified and the shape, width, and size specified as applicable, at the time of project acceptance. This price is full compensation for materials, application of MPM, equipment, labor, tools, and incidentals.

Surface preparation, when shown on the plans, will be paid for under Item 678, "Pavement Surface Preparation for Markings."

Special Specification 6156
LED High Mast Illumination Assemblies

1. DESCRIPTION

- **Installation.** Furnish and install light emitting diode (LED) high mast illumination assemblies.
- **Replace Luminaires (Light Fixtures)** Remove and replace existing luminaires with new LED luminaires.

2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 441, "Steel Structures,"
- Item 442, "Metal for Structures,"
- Item 445, "Galvanizing,"
- Item 616, "Performance Testing of Lighting Systems," and
- Item 620, "Electrical Conductors."

Fabrication plants that produce high mast rings and support assemblies must be approved in accordance with DMS-7380, "Steel Non-Bridge Member Fabrication Plant Qualification." The Department maintains an MPL of approved high mast ring and support assembly fabrication plants.

Provide 6 sets of submittals for the complete luminaire and photometric files in .ies format to the Engineer at the project address and the Engineering Operations section of TRF. Obtain the Engineer's approval on the submittals before purchasing materials and beginning work.

Furnish other high mast components from new material that are in accordance with DMS-11021, "High Mast Illumination Assembly Kits."

Provide prequalified high mast illumination assembly kits from the Department's MPL. When required by the Engineer, notify the Department in writing of selected materials from the MPL intended for use on each project.

Do not provide shop drawings for high mast ring and support assemblies fabricated in accordance with this Item and the details on the plans. For proposed deviations that do not affect the basic structural behavior of the high mast ring and support assembly, electronically submit shop drawings in accordance with Item 441, "Steel Structures." The submission of shop drawings is only required the first time each proposed non-structural deviation is used. Structural deviations from the approved drawings are not permitted.

3. EQUIPMENT

3.1. **General Requirements.** Provide symmetric or asymmetric area lighting, as shown on the descriptive codes. Provide six fixtures on each pole or as shown on the lighting layouts.

Provide LED luminaires listed to UL1598 and suitable for use in wet locations.

Provide internal label or marking with date code of when fixture was manufactured.

3.2. **Submittal Requirements.** For each type of luminaire, submit the following documentation:

3.2.1. Luminaire cut sheets;

3.2.2. Cut sheets for LED light sources;

3.2.3. Cut sheets for LED driver;

3.2.4. Cut sheets for surge protective device;

3.2.5. LM-79 luminaire photometric reports of a complete luminaire meeting this Specification for each optical configuration, from a National Voluntary Laboratory Accreditation Program (NVLAP)-accredited test laboratory located in the United States, that include:

- Name of test laboratory;
- Report number;
- Date;
- Complete luminaire catalog number. Include an explanation if catalog number in test reports does not match catalog number of luminaire submitted. Clarify whether discrepancy does not affect performance (e.g. in the case of different luminaire housing color);
- Description of luminaire, LED light sources, and LED drivers;
- Input power, voltage, current, frequency, and power factor;
- Goniophotometric report;
- Correlated Color Temperature (CCT);
- Color Rendering Index (CRI);
- TM-15-11 Backlight, Uplight, and Glare (BUG) rating;
- Photometric file in LM-63 format (i.e., filename.ies); and
- Photos of luminaires in test position, with test number written and visible on luminaire.

3.2.6. Calculations and supporting test data per Section 3.8, “Calculation of Light Loss Factor,” indicating specified lumen maintenance life including:

- LM-80 data;
- In-situ temperature measurement test (ISTMT) reports for representative luminaires according to UL 1598. Include an explanation of how ISTMT reports relate to luminaires submitted for Department use; and
- TM-21 analysis using the Energy Star TM-21 Calculator to predict lumen maintenance at 70,000 hr. and 25°C.

3.2.7. Computer-generated point-by-point photometric analysis of maintained photopic light levels in accordance with Section 3.9, “Performance Requirements,” using the .ies files and light loss factor calculated in Section 3.8;

3.2.8. Test reports showing results of 3G vibration tests in accordance with ANSI C136.31 for each size of luminaire per Section 3.3, “Housing;”

3.2.9. Written warranty and warranty service procedures per Section 3.7, “Warranty;” and

3.2.10. Nationally Recognized Testing Lab (NRTL) certification to UL 1598.

3.3. **Housing.** Provide luminaire housing, lens frame, and door constructed from 96% copper-free aluminum.

Meet ANSI 136.31, 3.0 G vibration requirements.

Permanently and clearly mark the housing with minimum 2-in. tall letters to indicate the photometric type as A, B, or S. Wattage labels are not required on high mast fixtures.

Provide slip fitter that will securely attach fixture to the tenon and ring assembly with a minimum of two bolts and a clamp. Provide a positive means of vertical adjustment, ± 5° from level.

Do not exceed a fixture weight of 80 lbs. or 2.62 sq. ft. effective projected area.

Fabricate exposed hardware, nuts, bolts, washers, and metal parts from stainless steel or aluminum of adequate thickness as approved.

Provide a passive thermal management system. Do not use fans or other mechanical cooling systems.

Provide fixtures with natural aluminum finish or paint fixtures light gray.

3.4. **LED Drivers and Electrical.** Provide luminaire with replaceable LED driver that will operate at 480v or as shown in the plans. Provide LED drivers meeting the following specifications:

- Rated case temperature suitable for operation in the luminaire at ambient temperature of -40 to +40°C;
- Power factor (PF) of at least 0.90 at full input power at the specified voltage;
- Reduced output power to LEDs if maximum allowable case temperature is exceeded; and
- Tolerates sustained open circuit and short circuit output conditions without damage.

Provide a barrier-type terminal block secured to housing for power connection to luminaire in accordance with ANSI 136.14 and ANSI 136.37. Provide lugs with screws for wire sizes up to 6 AWG. Identify each terminal position.

3.5. **LED Optical Assembly.** Provide LED optical assembly with nominal color temperature of 4000K. For verification testing, CCT within the range of 3710K–4260K is allowable.

Provide LED optical assembly with a minimum CRI of 70.

Ensure that optical compartment meets IEC Standard 60529-IP66.

For asymmetric fixtures, provide field-rotatable optics or means to rotate fixture. Provide accurate degree-of-rotation and “house-side” and “street-side” markings to ensure proper orientation of luminaires.

3.6. **Surge Protective Devices.** Provide luminaire with a surge protective device (SPD), in addition to driver’s internal protection, to withstand repetitive noise transients from utility line switching, nearby lightning strikes, and other interference. Provide SPD that will protect the luminaire from common mode transient peak voltages up to 10 kV (minimum) and transient peak currents up to 10 kA (minimum). Provide SPD tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Location Category C-High for Line-Ground, Line-Neutral, and Neutral-Ground. Provide SPD listed or recognized by a NRTL to UL 1449, 3rd edition.

3.7. **Warranty.** The manufacturer will replace failed luminaires, when non-operable due to defect in material or workmanship, within ten years of installation with a luminaire that meets all specifications, delivered to the project location.

The warranty must cover maintained integrity and functionality of:

- Luminaire housing, wiring, and connections;
- LED light sources—negligible light output from more than 10% of the LED packages constitutes luminaire failure; and
- LED drivers.

The warranty period will begin 90 days after date of manufacture as shown on internal label, or as negotiated by owner such as in the case of an auditable asset management system. Photocells are subject to the warranties of their respective manufacturers.

3.8. **Calculation of Light Loss Factor (LLF).** Submit calculations per IES TM-21 predicting lumen maintenance at the luminaire level using In-Situ Temperature Measurement Testing (ISTMT) and LM-80 data.

3.8.1. Meet all of the conditions below.

- The LED light sources have been tested according to LM-80. Provide verification from the LED or luminaire manufacturer that the LM-80 report corresponds to the LEDs in the luminaire being tested.
- The LED drive current specified by the luminaire manufacturer is less than or equal to the appropriate drive current specified in the LM-80 test report.
- The LED light source manufacturer prescribes/indicates a temperature measurement point (TS) on the light sources.
- For the hottest LED light source in the luminaire, the temperature measured at the TS during ISTMT is less than or equal to the appropriate temperature specified in the LM-80 test report for the corresponding drive current or higher, within the manufacturer's specified operating current range.

3.8.2. Conduct the ISTMT using the same configuration of luminaires submitted, or another luminaire from the same product family having:

- The same or lower nominal CCT;
- The same or higher nominal drive current;
- The same or greater number of LED light sources;
- The same or lower percentage driver loading and efficiency; and
- The same or smaller size luminaire housing.

Install luminaire as defined by ANSI/UL 1598 (hardwired luminaires).

3.8.3. Include in the ISTMT report:

- Photos of thermocouple locations and luminaire in testing position;
- Ambient test temperature;
- LED temperature;
- Maximum LED current; and
- Full description of luminaire used in test.

3.8.4. Calculate LLF for each fixture configuration using the submitted ISTMT data, LM-80 data, and Energy Star TM-21 calculator.

- Provide documentation of in situ temperature at 25°C ambient for the luminaire rating submitted for approval;
- Calculate the lumen depreciation at 70,000 hr. at the documented in situ temperature at 25°C ambient using the Energy Star TM-21 calculator;
- LLF = Manufacturer's documented lamp lumen depreciation (LLD) factor per TM-21 calculations at 25°C at 70,000 hr. × 0.90 Luminaire Dirt Depreciation; and
- Total light loss factor is not to exceed 30% system depreciation (0.70) over 70,000 hr.

3.8.5. Calculated LLF will be used for design purposes and to determine if luminaire meets the performance specification.

3.9. **Performance Requirements.** The Department will evaluate fixtures using submitted photometric data.

3.9.1. **Type A Asymmetric Fixtures.** The Department will use the submitted photometric data to run the following test in AGI32 Roadway Optimizer with the following settings:

3.9.1.1. **Layout:**

- grid 100 ft. wide by 920 ft. long;
- grid points spaced according to IESNA RP-8 for a roadway with eight 12.5 ft. lanes;

- poles on one side of the roadway spaced at 920 ft. with 30 ft. setback from edge of grid; and
- 150 ft. poles with six fixtures oriented toward the grid, LLF as calculated in Section 3.8.

3.9.1.2. **Test Criteria for Passing:**

- minimum > 0.20 footcandle;
- average > 0.80 footcandle;
- average/minimum ratio < 4.0:1; and
- IESNA TM-15-11 BUG rating with an Uplight value of U0.

3.9.2. **Type B Asymmetric Fixtures.** The Department will use the submitted photometric data to run the following test in AGI32 Roadway Optimizer with the following settings:

3.9.2.1. **Layout:**

- grid 175 ft. wide by 800 ft. long;
- grid points spaced according to IESNA RP-8 for a roadway with fourteen 12.5 ft. lanes;
- poles on one side of the roadway spaced at 800 ft. with 30 ft. setback from edge of grid; and
- 150 ft. poles with six fixtures oriented toward the grid, LLF as calculated in Section 3.8.

3.9.2.2. **Test Criteria for Passing:**

- minimum > 0.20 footcandle;
- average > 0.80 footcandle;
- average/minimum ratio < 4.0:1; and
- IESNA TM-15-11 BUG rating with an Uplight value of U0.

3.9.3. **Type S Symmetric Fixtures.** The Department will use the submitted photometric data to run the following test in AGI32 Roadway Optimizer with the following settings:

3.9.3.1. **Layout:**

- grid 450 ft. wide by 450 ft. long, with calculation points spaced 10 ft. apart;
- 150 ft. poles with six fixtures oriented toward the grid, LLF as calculated in Section 3.8; and
- single pole spaced in the center of the grid.

3.9.3.2. **Test Criteria for Passing:**

- minimum > 0.20 footcandle; and
- IESNA TM-15-11 BUG rating with an Uplight value of U0.

4. CONSTRUCTION

Perform work in accordance with the details shown on the plans and the requirements of this Item.

Permanently mark each high mast ring and support assembly with the insignia or trademark of the fabrication plant. Place the mark at an approved location. Galvanize the ring assemblies; assemble the ring halves in the shop to ensure proper fit, and match-mark the ring halves before shipping. Prevent scarring or marring of the ring assemblies. Replace damaged components.

Repair damaged galvanized areas of the ring assembly in accordance with Section 445.3.5., “Repairs.”

4.1. **Installation.** Furnish and install LED high mast illumination assemblies in accordance with the details, dimensions, and requirements shown on the plans.

4.2. **Replace Luminaires.** Remove existing luminaires. Furnish and install LED high mast luminaires in accordance with the details, dimensions, and requirements shown on the plans.

5. MEASUREMENT

This Item will be measured as each LED high mast illumination assembly installed.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "LED High Mast Illumination Assemblies" of the types specified.

New poles for high mast illumination assemblies will be paid for under Item 613, "High Mast Illumination Poles." New electrical services will be paid for under Item 628, "Electrical Services." The Department will pay for electrical energy consumed by the lighting system.

6.1. **Installation.** This price is full compensation for furnishing, installing and testing light fixtures, LEDs, drivers, wire rope, rings and ring support assemblies; aiming light fixtures; furnishing and installing obstruction lights, hoisting assemblies, power drive assemblies, transformers, conductors on the load side of the high mast pole's disconnect, electrical equipment, electrical cord, junction boxes and enclosures; conducting system performance testing; and materials, equipment, labor, tools, and incidentals.

6.2. **Replace Luminaires.** This price is full compensation for removing, salvaging, disassembling, and stockpiling existing luminaires; furnishing and installing new luminaires, connections, conductors, and conduit on the ring; rewiring circuits on the ring; replacing damaged components; disposal of unsalvageable materials; conducting system performance testing; and materials, equipment, labor, tools, and incidentals.

Special Specification 6185

Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

1. DESCRIPTION

Furnish, operate, maintain and remove upon completion of work, Truck Mounted Attenuator (TMA) or Trailer Attenuator (TA).

2. MATERIALS

Furnish, operate and maintain new or used TMAs or TAs. Assure used attenuators are in good working condition and are approved for use. A list of approved TMA/TA units can be found in the Department's Compliant Work Zone Traffic Control Devices List. The host vehicle for the TMA and TA must weigh a minimum of 19,000 lbs. Host vehicles may be ballasted to achieve the required weight. Any weight added to the host vehicle must be properly attached or contained within it so that it does not present a hazard and that proper energy dissipation occurs if the attenuator is impacted from behind by a large truck. The weight of a TA will not be considered in the weight of the host vehicle but the weight of a TMA may be included in the weight of the host vehicle. Upon request, provide either a manufacturer's curb weight or a certified scales weight ticket to the Engineer.

3. CONSTRUCTION

Place or relocate TMA/TAs as shown on the plans or as directed. The plans will show the number of TMA/TAs needed, for how many days or hours, and for which construction phases.

Maintain the TMA/TAs in good working condition. Replace damaged TMA/TAs as soon as possible.

4. MEASUREMENT

4.1. **Truck Mounted Attenuator/Trailer Attenuator (Stationary).** This Item will be measured by the each or by the day. TMA/TAs must be set up in a work area and operational before a calendar day can be considered measurable. When measurement by the day is specified, a day will be measured for each TMA/TA set up and operational on the worksite.

4.2. **Truck Mounted Attenuator/Trailer Attenuator (Mobile Operation).** This Item will be measured by the hour. The time begins once the TMA/TA is ready for operation at the predetermined site and stops when notified by the Engineer. A minimum of 4 hr. will be paid each day for each operating TMA/TA used in a mobile operation.

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 "Truck Mounted Attenuators/Trailer Attenuators (Stationary)," or "Truck Mounted Attenuators/Trailer Attenuators (Mobile Operation)." This price is full compensation for furnishing TMA/TA: set up; relocating; removing; operating; fuel; and equipment, materials, tools, labor, and incidentals.

Special Specification 6438

Mobile Retroreflectivity Data Collection for Pavement Markings

1. DESCRIPTION

Furnish mobile retroreflectivity data collection (MRDC) for pavement markings on roadways as shown on the plans or as designated by the Engineer. Conduct MRDC on dry pavement only. Provider is defined as the Contractor or Subcontractor who collects the MRDC data.

2. EQUIPMENT AND PERSONNEL

2.1. **Mobile Retroreflectometer**. Provide a self-propelled, mobile retroreflectometer certified by the Texas A&M Transportation Institute (TTI) Mobile Retroreflectometer Certification Program.

2.2. **Portable Retroreflectometer**. Provide a portable retroreflectometer that uses 30-meter geometry meeting the requirements described in ASTM E 1710. Maintain, service, and calibrate all portable retroreflectometers according to the manufacturer's instructions.

2.3. **Operating Personnel for Mobile Retroreflectometer**. Provide all personnel required to operate the mobile retroreflectometer and portable retroreflectometer. Ensure MRDC system operator has a current certification from the TTI Mobile Retroreflectometer Certification Program to conduct MRDC with the certified mobile retroreflectometer provided.

2.4. **Additional Personnel**. Provide any other personnel necessary to compile, evaluate, and submit MRDC.

2.5. **Safety Equipment**. Supply and operate all required safety equipment to perform this service.

3. MRDC DOCUMENTATION AND TESTING

Document all MRDC by county and roadway or as directed by the Engineer. Submit all data to the Department and to the TTI Mobile Retroreflectometer Certification Program no later than three working days after the day the data is collected. Submit all raw data collected in addition to all other data submitted. Provide data files in Microsoft Excel format or a format approved by the Engineer. Provide measurement notification and field tests as specified. Verification and referee testing may be conducted at the Department's discretion.

3.1. **Preliminary Documentation Sample**. Submit a sample data file, video, and map of MRDC data in the required format 10 working days before beginning any work. The format must meet specification and be approved by the Engineer before any work may begin.

3.2. **Initial Documentation Review and Approval**. The Department will review documentation submitted for the first day of MRDC, and if it does not meet specification requirements, will not allow further MRDC until deficiencies are corrected. The Department will inform the Provider no later than three working days after submittal if the first day of MRDC does not meet specification requirements. Time charges will continue unless otherwise directed by the Engineer.

3.3. **Data File**. Provide data files with the following:

- date;
- district number;

- county;
- Project CSJ number;
- name of mobile retroreflectometer operator;
- route number with reference markers or other reference information provided by the Engineer to indicate the location of beginning and end data collection points on that roadway;
- cardinal direction;
- line type (single solid, single broken, double solid, etc.);
- line color;
- file name corresponding to video;
- data for each centerline listed separately;
- average reading taken for each 0.1-mi. interval (or interval designated by the Engineer);
- accurate GPS coordinates (within 20 ft.) for each interval;
- color-coding for each interval indicating passing or failing, unless otherwise directed by the Engineer (passing and failing thresholds provided by the Engineer);
- graphical representation of the MRDC (y-axis showing retroreflectivity and x-axis showing intervals) corresponding with each data file;
- distance in miles driven while measuring the pavement markings;
- event codes (pre-approved by the Engineer) indicating problems with measurement;
- portable retroreflectometer field check average reading and corresponding mobile average reading for that interval when applicable; and
- upper validation threshold (may be included separately with the raw data but must be clearly identified with the data collected using that threshold).

3.4. **Map**. Provide a map in an electronic format approved by the Engineer with each MRDC submission that includes the following information:

- date;
- district number;
- county;
- color-coded 1-mi. intervals (or interval length designated by the Engineer) for passing and failing retroreflectivity values or retroreflectivity threshold values provided by the Engineer; and
- percentage of passing and failing intervals, if required by the Engineer.

3.5. **Video**. Provide a high-quality DVD or electronic video file with the following information:

- date and corresponding data file name on label;
- district number;
- county;
- route number with reference markers or other designated reference information to indicate the location of beginning and end collection points on that roadway; and
- retroreflectivity values presented on the same screen with the following information:
  - date;
  - location;
  - starting and ending mileage;
  - total miles;
  - retroreflectivity readings; and
  - upper validation thresholds (may be included separately with the raw data but must be clearly identified with the data collected using that threshold).

3.6. **Field Comparison Checks with a Portable Retroreflectometer**. Take a set of field comparison readings with the portable retroreflectometer at least once every 4 hr. while conducting MRDC or at the frequency designated by the Engineer. Take a minimum of 20 readings, spread out over the interval measured. List the average portable retroreflectometer reading next to the mobile average reading for that interval with the

reported MRDC data. Request approval from the Engineer to take field comparison readings on a separate roadway, when measuring a roadway where portable retroreflectometer readings are difficult to take. Take the off-location field comparison readings at no additional cost. Submit the portable retroreflectometer printout of all the readings taken for the field comparison check with the corresponding MRDC data submitted. The mobile average reading must be within ±15% of the portable average reading. The Engineer may require new MRDC for some or all of the pavement markings measured in a 4-hr. interval before a field comparison check not meeting the ±15% range. Provide the new MRDC at no extra cost to the Department. The Engineer may take readings with a Department portable retroreflectometer to ensure accuracy at any time. The Department's Materials and Tests Division (MTD) will take comparison readings and serve as the referee if there is a significant difference between the Engineer's portable readings and the Provider's mobile and handheld readings. For best results, take field comparison readings on a fairly flat and straight roadway when possible.

3.7. **Periodic Field Checks at Pre-Measured Locations**. When requested by the Engineer, measure with the mobile unit and report to the Engineer immediately after measurement the average retroreflectivity values for a designated pre-measured test location. The Engineer will have taken measurements at the test location within 10 days of the test. The test location will not include pavement markings less than 30 days old. If the measured averages do not fall within ±15% of the pre-measured averages, further calibration and comparison measurements may be required before any further MRDC. Submit the results of the field check with the MRDC report for that day.

3.8. **Measurement Notification**. Provide notification via email to Mobileretro@tamu.edu with a carbon copy to the Engineer a minimum of 24 hr. before mobile retroreflectivity data collection to allow for scheduling verification testing when needed.

3.9. **Verification Testing.** The Engineer or a third party may perform retroreflectivity verification testing within seven days of the Provider's retroreflectivity readings. The Provider-submitted retroreflectivity data will be compared to the verification test data to determine acceptability of the Provider's mobile retroreflectometer data. Comparison of the data will result in one of the two scenarios below:

- Provider's Data is Validated – if the difference between Provider's and Engineer-third party data is 20% or less, then the Provider's data is validated. The Provider's data will be used for acceptance.

- Provider's Data is not Validated – if the difference between Provider's and Engineer-third party data is more than 20%, then the Provider's data is not validated. The Engineer-third party data will be used for acceptance and the Provider will be required to take corrective action before additional Provider data collection and may require re-certification of the mobile retroreflectometer. If the Engineer determines that the Provider's data might be correct then, referee testing may be requested by the Engineer.

3.10. **Referee Testing.** MTD will perform referee testing using portable retroreflectometers to determine if the markings need to be restriped to meet the required retroreflectivity level. The referee test results will be final. Referee testing will be conducted on the verification test sections using the method for portable retroreflectometers specified in Item 666, "Reflectorized Pavement Markings."

4. FINAL REPORT

Submit a final report in the format specified by the Engineer to the Department's Traffic Engineering representative within one calendar week after the service is complete. The final report must contain a list of all problems encountered (pre-approved event codes) and the locations where problems occurred during MRDC.

5. MEASUREMENT

When mobile retroreflectivity data collection for pavement markings is specified on the plans to be a pay item, measurement will be by the mile driven while measuring pavement markings.

6. PAYMENT

Unless otherwise specified on the plans, the work performed, materials furnished, equipment, labor, tools, and incidentals will not be paid for directly, but will be considered subsidiary to bid items of the Contract. When mobile retroreflectivity data collection for pavement markings is specified on the plans to be a pay item, the work performed in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Mobile Retroreflectivity Data Collection." This price is full compensation for providing summaries of readings to the Engineer, equipment calibration and prequalification, equipment, labor, tools, and incidentals.