

THIS BID MUST BE FILED IN A SEALED BID ENVELOPE

SPECIFICATIONS AND BID

FOR

FORT BEND COUNTY TOLL ROAD AUTHORITY
FORT BEND PARKWAY TOLL ROAD

SH 6 Crossing

From 0.59 Miles North of SH 6 to 0.38 Miles South of SH 6

Notice To Bidder:

ALL BIDS ARE TO BE SUBMITTED TO THE FORT BEND COUNTY TOLL ROAD AUTHORITY, C/O MIKE STONE ASSOCIATES, 19875 SOUTHWEST FREEWAY, SUITE 270, SUGAR LAND, TEXAS, 77479 BY 2:00 P.M. ON WEDNESDAY, NOVEMBER 12, 2014.

BIDDER IS REQUIRED TO FILL IN INFORMATION BELOW:

WILLIAMS BROTHERS CONSTRUCTION CO., INC.

BIDDER (Company Name)

30,353,132⁸⁹
~~31,153,152.89~~ *RTR*
~~31,153,152.89~~ *RTR.*

TOTAL AMOUNT OF BID \$

~~31,153,152.89~~
~~31,153,152.89~~ *RTR*

FORT BEND COUNTY, TEXAS

BID TO
FORT BEND COUNTY TOLL ROAD AUTHORITY
FORT BEND PARKWAY TOLL ROAD
SH 6 Crossing
From 0.59 Miles North of SH 6 to 0.38 Miles South of SH 6

The undersigned, as bidder, declare that the only person or parties interested in this bid as principals are those named herein; that this bid is made without collusion with any other person, firm, or corporation, that he has carefully examined the form of contract, instructions to bidders, profiles, grades, specifications, and the plans therein referred to, and has carefully examined the location and local conditions of and the classes of materials prescribed for, the proposed work, and agree that he will perform the work and services and furnish the materials, supplies, and equipment, and incidentals necessary to complete the contract, if awarded, in a good and workmanlike manner in accordance with this bid and with the plans, specifications and special provisions if any, incorporated therein.

It is further agreed that the quantities of work to be performed and materials to be furnished may be increased or diminished as may be necessary in the opinion of the Engineer to complete the work fully as planned and contemplated, and that all quantities of work and materials, whether increased or decreased, are to be performed or furnished at the unit prices set forth below except as provided for in the specifications, but such changes shall be made only in strict accord with the specifications and contract, and in no other manner.

The undersigned agree and pledge himself/themselves to complete the work in full within the time stated in the specifications.

Accompanying this bid is a bid bond or cashier's check payable to the order of Fort Bend County Toll Road Authority (FBCTRA), for FIVE PERCENT OF TOTAL dollars (\$ 5% OF TOTAL), said check to be returned to the bidder, unless this bid is accepted and he shall fail to execute a contract and file a bond within ten (10) days of its acceptance and the award of a contract, in which case the bidder herein now agrees said check shall be forfeited and become the property of FBCTRA, as payment for agreed and liquidated damages due to delay and other inconveniences suffered by the FBCTRA on account of failure of the bidder to execute a contract and file the bond required by law and the specifications. It is understood that FBCTRA reserves the right to reject any and all bids. The work proposed to be done shall be accepted only when fully completed and finished to the entire satisfaction of the Engineer and the FBCTRA and in strict compliance with the provisions of the specifications and contract.

It is further agreed that the work is to be completed in full in 628 calendar days.

The undersigned lists the following work of similar character completed by him:

(ATTACHED)

WILLIAMS BROTHERS CONSTRUCTION CO., INC.

COMPANY NAME

AUTHORIZED SIGNATURE

Randy T Rogers

TITLE

VICE PRESIDENT
3000 MILAM

STREET ADDRESS

HOUSTON, TX 77006

MAILING ADDRESS

P.O. BOX 66428

HOUSTON, TX 77266

PHONE

(713) 522-9821

NOTE: Signatures to comply with the Specifications & Letter of Evidence. ORIGINAL SIGNATURE MUST APPEAR ON THIS FORM.

(ATTACHED)

CONTRACT WITH FORT BEND COUNTY TOLL ROAD AUTHORITY

THE STATE OF TEXAS §
COUNTY OF FORT BEND §

Contractor hereby contracts and agrees with Fort Bend County Toll Road Authority to perform the work and services and to furnish the materials, supplies, and equipment, and incidentals necessary to complete this contract in a good and workmanlike manner in accordance with his bid and with the plans, specifications, and special provisions prepared by the Engineer, for

FORT BEND COUNTY TOLL ROAD AUTHORITY FORT BEND PARKWAY TOLL ROAD SH 6 Crossing From 0.59 Miles North of SH 6 to 0.38 Miles South of SH 6

Unit and Section

The Contractor represents to the Fort Bend County Toll Road Authority (FBCTRA) that he has carefully examined this contract and the plans, specifications, and special provisions attached to and made a part of this contract on which his bid is based, and is thoroughly familiar therewith.

The FBCTRA agrees to pay to the Contractor for the performance of all the obligations of this contract in a good and workmanlike manner in accordance with the plans, specifications, and special provisions, the several installments, at the rates and at the times and in the manner specified therein, not exceeding in the aggregate the sum of Thirty million three hundred fifty three thousand one hundred dollars (\$ 30,353,132.89), thirty two dollars and eighty nine cents.

The Contractor agrees to begin the performance of the work on the date fixed in the contract requisition when it shall have been issued, and to prosecute it diligently to completion.

The deposit of a copy of the contract requisition in the United States mail addressed to the Contractor at P.O. Box 66428 HOUSTON, TX 77266 shall be sufficient notice of the issuance of such requisition and of the date performance shall begin.

Wherever any notice to the Contractor by the FBCTRA may be required or desirable under the terms of this agreement and related documents, such notice shall be sufficient if it be in writing, addressed to the Contractor at the above address, and deposited in the United States mail.

This contract and all obligations therein are performable in Fort Bend County, Texas. Executed at Sugar Land, Texas, this _____ day of _____ 2014.

ATTEST:

[Signature]

DECEMBER 22, 2014

RECOMMENDED FOR APPROVAL

[Signature]
Engineer

FORT BEND COUNTY TOLL ROAD AUTHORITY
FORT BEND COUNTY, TEXAS

BY:

[Signature]
Chairman

BY:

WILLIAMS BROTHERS CONSTRUCTION Co., Inc.
Contractor Company Name

BY:

[Signature]
Signature

President
Title

FORT BEND PARKWAY TOLL ROAD AUTHORITY

FORT BEND PARKWAY TOLL ROAD

SH 6 CROSSING

FROM 0.59 MILES NORTH OF SH 6 TO 0.38 MILES SOUTH OF SH 6

COUNTY: FORT BEND		PROPOSAL SHEET			AUTH	USE ONLY	Williams Brothers	
TxDOT ITEM-CODE		UNIT BID PRICE ONLY,			UNIT	APPROX. QUANTITIES	Constructions	
ALT.	ITEM NO.						DESC. CODE	Co., INC.
						Unit bid Price	Amount	
	100	2002	PREPARING R.O.W.	STA	63.50	\$ 53,000.00	\$ 3,365,500.00	
	104	2001	REMOVING CONC (PAV)	SY	986.00	\$ 7.00	\$ 6,902.00	
	104	2009	REMOVE CONC (RIPRAP)	SY	50.00	\$ 7.00	\$ 350.00	
	104	2021	REMOVING CONC (CURB)	LF	2,178.00	\$ 2.00	\$ 4,356.00	
	105	2014	REMOVING STAB BASE & ASPH PAV (7"-12")	SY	10,866.00	\$ 5.00	\$ 54,330.00	
	110	2001	EXCAVATION(ROADWAY)	CY	9,582.00	\$ 12.00	\$ 114,984.00	
	110	2002	EXCAVATION (CHANNEL)	CY	15,736.00	\$ 12.00	\$ 188,832.00	
	132	2006	EMBANKMENT(FINAL)(DENS CONT)(TY C)	CY	43,749.00	\$ 3.00	\$ 131,247.00	
	132	2036	EMBANK(FINAL)(DC)(TY E)(CSBE)	CY	3,821.00	\$ 20.00	\$ 76,420.00	
	132	2037	EMBANK(FNL)(DC)(TY E)(CSBE)(RWALL FND IMPR)	CY	1,738.90	\$ 20.00	\$ 34,778.00	
	162	2002	BLOCK SODDING	SY	112,335.00	\$ 2.50	\$ 280,837.50	
	162	2003	STRAW OR HAY MULCH	SY	112,335.00	\$ 0.15	\$ 16,850.25	
	164	2051	DRILL SEED (TEMP)(WARM OR COOL)	SY	112,335.00	\$ 0.10	\$ 11,233.50	
	166	2001	FERTILIZER	AC	23.20	\$ 600.00	\$ 13,920.00	
	168	2001	VEGETATIVE WATERING	MG	2,785.20	\$ 12.00	\$ 33,422.40	
	260	2006	LIME TRT(EXST MATL)(6")	SY	36,215.00	\$ 2.00	\$ 72,430.00	
	260	2012	LIME (HYD. COM OR QK)(SLRY) OR QK(DRY)	TON	488.70	\$ 150.00	\$ 73,305.00	
	276	2224	CEM TRT(PLNT MX)(CL N)(TY E)(GR 4)(6")	SY	36,215.00	\$ 4.00	\$ 144,860.00	
	292	2007	ASPHALT STAB BASE (GR 2) (PG 64)	TON	746.00	\$ 70.00	\$ 52,220.00	
	292	2017	ASPHALT STAB BASE(GR 4)(PG 64)	TON	1,991.90	\$ 60.00	\$ 119,514.00	
	360	2003	CONC PVMT(CONT REINF-CRCP)(10")	SY	12,006.00	\$ 50.00	\$ 600,300.00	
	360	2004	CONC PVMT(CONT REINF-CRCP)(11")	SY	21,471.00	\$ 25.00	\$ 536,775.00	
	368	2001	WIDE FLANGE PAVEMENT TERMINALS	LF	174.84	\$ 200.00	\$ 34,968.00	
	400	2001	STRUCT EXCAV	CY	3,004.90	\$ 2.00	\$ 6,009.80	
	400	2005	CEM STABILIZED BACKFILL	CY	2,386.70	\$ 26.35	\$ 62,889.55	
	400	2016	CEMENT STAB BACKFILL (INLET OR MH)	CY	380.80	\$ 26.35	\$ 10,034.08	
	402	2001	TRENCH EXCAVATION PROTECTION	LF	4,215.00	\$ 0.75	\$ 3,161.25	
	403	2001	TEMPORARY SPL SHORING	SF	2,348.00	\$ 1.00	\$ 2,348.00	
	416	2004	DRILL SHAFT (36 IN)	LF	1,276.00	\$ 150.00	\$ 191,400.00	
	416	2008	DRILL SHAFT (60 IN)	LF	3,816.00	\$ 250.00	\$ 954,000.00	
	416	2012	DRILL SHAFT (84 IN)	LF	1,617.00	\$ 500.00	\$ 808,500.00	
	416	2015	DRILL SHAFT (NON-REINFORCED)(12 IN)	LF	32.00	\$ 75.00	\$ 2,400.00	
	416	2018	DRILL SHAFT (SIGN MTS)(24 IN)	LF	26.00	\$ 90.00	\$ 2,340.00	
	416	2029	DRILL SHALT (RDWY ILL POLE) (30 IN)	LF	104.00	\$ 195.00	\$ 20,280.00	
	416	2038	DRILL SHAFT (108 IN)	LF	540.00	\$ 700.00	\$ 378,000.00	
	416	2047	DRILL SHAFT (96 IN)	LF	741.00	\$ 600.00	\$ 444,600.00	
	416	2051	DRILL SHAFT (120 IN)	LF	1,599.00	\$ 900.00	\$ 1,439,100.00	
	420	2003	CL C CONC (ABUT)	CY	85.80	\$ 700.00	\$ 60,060.00	
	420	2018	CL C CONC (FOOTING)(MASS PLACEMENT)	CY	1,183.11	\$ 400.00	\$ 473,244.00	
	420	2019	CL C CONC (CAP)	CY	2,544.20	\$ 450.00	\$ 1,144,890.00	
	420	2055	CL C CONC (COLUMN)(MASS PLACEMENT)	CY	3,636.00	\$ 600.00	\$ 2,181,600.00	
	420	2221	CL S CONC (JUNCTION BOX)	CY	36.50	\$ 1,312.00	\$ 47,888.00	
	422	2001	REINF CONC SLAB	SF	265,822.00	\$ 8.00	\$ 2,126,576.00	
	423	2004	REATAINING WALL (MSE)(FRAC FIN)	SF	18,478.00	\$ 30.00	\$ 554,340.00	
	425	2068	PRESTR CONC GIRDER (TY TX54)	LF	25,818.28	\$ 120.00	\$ 3,098,193.60	
	432	2001	RIPRAP (CONC)(4 IN)	CY	6.00	\$ 400.00	\$ 2,400.00	
	432	2039	RIPRAP(MOW STRIP)(4 IN)	CY	37.20	\$ 500.00	\$ 18,600.00	
	432	2084	RIPRAP (CONC)(CL B)(4")	CY	150.90	\$ 400.00	\$ 60,360.00	
	434	2033	ELASTOMERIC BEAR (E7)	EA	11.00	\$ 2,000.00	\$ 22,000.00	
	434	2072	ELASTOMERIC BEAR (F7)	EA	11.00	\$ 2,000.00	\$ 22,000.00	
	434	2077	ELASTOMERIC BEAR (ES4)	EA	11.00	\$ 2,000.00	\$ 22,000.00	
	434	2087	ELASTOMERIC BEAR (EE4)	EA	11.00	\$ 2,000.00	\$ 22,000.00	
	442	2002	STR STL (PLATE GIRDER)	LB	3,509,621.00	\$ 1.44	\$ 5,053,854.24	
	442	2048	STRUCTURAL STEEL (MISC NON-BRIDGE)	LB	836.00	\$ 2.00	\$ 1,672.00	
	450	2013	RAIL(TY SSTR)	LF	7,296.60	\$ 20.00	\$ 145,932.00	
	450	2109	RAIL(TY SSTR) W/DRAIN SLOTS	LF	2,156.00	\$ 20.00	\$ 43,120.00	
	454	2001	SEAL EXPANSION JOINT (4 IN) (SEJ-A)	LF	870.00	\$ 75.00	\$ 65,250.00	
	462	2002	CONC BOX CULV (3 FT X 3 FT)	LF	30.00	\$ 174.35	\$ 5,230.50	

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY	Williams Brothers	
TxDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX.	Constructions	
ALT.	ITEM	DESC.			QUANTITIES	Co., INC.	
	NO.	CODE				Unit bid Price	Amount
	464	2003	RC PIPE(CL III)(18 IN)	LF	673.00	\$ 59.85	\$ 40,279.05
	464	2005	RC PIPE(CL III)(24 IN)	LF	2,943.00	\$ 45.10	\$ 132,729.30
	464	2007	RC PIPE(CL III)(30 IN)	LF	310.00	\$ 64.00	\$ 19,840.00
	464	2009	RC PIPE (CL III)(36 IN)	LF	244.00	\$ 84.90	\$ 20,715.60
	464	2010	RC PIPE (CL III)(42 IN)	LF	115.00	\$ 105.70	\$ 12,155.50
	464	2011	RC PIPE (CL III)(48 IN)	LF	228.00	\$ 115.80	\$ 26,402.40
	464	2036	RC PIPE (CL V)(24 IN)	LF	76.00	\$ 63.10	\$ 4,795.60
	465	2001	INLET (COMPL)(TY C)	EA	11.00	\$ 2,972.00	\$ 32,692.00
	465	2010	INLET (COMPL) (TY AAD)	EA	4.00	\$ 4,124.00	\$ 16,496.00
	465	2013	MANH (COMPL) (TY A)	EA	7.00	\$ 4,137.00	\$ 28,959.00
	465	2104	INLET EXT	EA	6.00	\$ 674.00	\$ 4,044.00
	465	2119	INLET(COMPL)(TY AZ)	EA	16.00	\$ 4,107.00	\$ 65,712.00
	465	2120	INLET (COMPL)(TY AZR)	EA	1.00	\$ 4,229.00	\$ 4,229.00
	465	2255	INLET(COMPL)(TY AZ2G)	EA	4.00	\$ 4,977.00	\$ 19,908.00
	467	2023	SET (TY I)(S=3 FT)(HW=3 FT)(3:1)C	EA	1.00	\$ 3,691.00	\$ 3,691.00
	467	2211	SET (TY II) (24 IN) (RCP) (3:1) (P) C	EA	3.00	\$ 583.00	\$ 1,749.00
	467	2213	SET (TY II) (30 IN) (RCP) (3:1) (P) C	EA	1.00	\$ 808.00	\$ 808.00
	467	2216	SET (TY II) (42 IN) (RCP) (3:1) (P) C	EA	1.00	\$ 3,274.00	\$ 3,274.00
	467	2217	SET (TY II) (48 IN) (RCP) (3:1) (P) C	EA	1.00	\$ 3,965.00	\$ 3,965.00
	467	2224	SET(TY II)(24 IN)(RCP)(4:1) (C)	EA	3.00	\$ 668.00	\$ 2,004.00
	471	2007	GRATE AND FRAME (BRIDGE DRAIN)	EA	50.00	\$ 3,500.00	\$ 175,000.00
	476	2005	JACK BOR OR TUN PIPE (42 IN)(RC)(CL III)	LF	84.00	\$ 937.00	\$ 78,708.00
	496	2002	REMOV STR (INLET)	EA	1.00	\$ 300.00	\$ 300.00
	496	2007	REMOV STR (PIPE)	LF	144.00	\$ 36.45	\$ 5,248.80
	496	2008	REMOV STR (BOX CULVERT)	LF	72.00	\$ 59.50	\$ 4,284.00
	500	2001	MOBILIZATION	LS	1.00	\$ 3,139,901.00	\$ 3,139,901.00
	502	2001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	20.00	\$ 5,000.00	\$ 100,000.00
	512	2008	PORT CTB(FUR & INST)(LOW PROF)(TY I)	LF	980.00	\$ 35.00	\$ 34,300.00
	512	2009	PORT CTB(FUR & INST)(LOW PROF)(TY2)	LF	40.00	\$ 35.00	\$ 1,400.00
	512	2026	PORT CTB(MOVE)(LOW PROF)(TY 1)	LF	300.00	\$ 10.00	\$ 3,000.00
	512	2027	PORT CTB(MOVE)(LOW PROF)(TY 2)	LF	20.00	\$ 10.00	\$ 200.00
	512	2040	PORT CTB (REMOVE)(SNGL SLP)(TY 1)	LF	102.00	\$ 10.00	\$ 1,020.00
	512	2044	PORT CTB (REMOVE)(LOW PROF)(TY I)	LF	1,780.00	\$ 5.00	\$ 8,900.00
	512	2045	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	80.00	\$ 5.00	\$ 400.00
	512	2060	PORT CTB (MOVE)(SNGL-SLP)(TY J-J)	LF	540.00	\$ 7.00	\$ 3,780.00
	512	2062	PORT CTB (REMOVE)(SNGLE SLP)(TYP J-J)	LF	1,792.00	\$ 5.00	\$ 8,960.00
	514	2004	PERM CONC TRF BARR (SGL SLP)(TY 1)(42")	LF	4,971.00	\$ 25.00	\$ 124,275.00
	514	2022	PERM CONC TRF BARR (SGL SLP)(TY 4)(42")	LF	250.00	\$ 115.00	\$ 28,750.00
	529	2006	CONC CURB(MONO)(TY II)	LF	5,231.00	\$ 5.00	\$ 26,155.00
	529	2007	CONC CURB (DOWEL)	LF	994.00	\$ 9.00	\$ 8,946.00
	529	2070	CONCRETE CURB (TYPE U-TURN)(SPECIAL)	LF	392.00	\$ 34.00	\$ 13,328.00
	545	2022	CRASH CUSH ATTEN(INSTL)(REACT)(N)	EA	2.00	\$ 1,000.00	\$ 2,000.00
	610	2025	INS RD IL AM (TY SA) 40T-8-8 (.25 KW) S	EA	1.00	\$ 2,810.00	\$ 2,810.00
	610	2045	INS RD IL AM (TY SP) 38S-8-8 (.25KW)S	EA	25.00	\$ 3,605.00	\$ 90,125.00
	610	2060	INS RD IL AM (U/P) (TY I) (.15 KW) S	EA	11.00	\$ 975.00	\$ 10,725.00
	610	2064	RELOCATE RD IL ASM (TRANS-BASE)	EA	12.00	\$ 1,550.00	\$ 18,600.00
	618	2034	CONDT (PVC) (SCHD 80) (2")	LF	2,899.00	\$ 4.50	\$ 13,045.50
	618	2035	CONDT (PVC) (SCHD 80) (2") (BORE)	LF	121.00	\$ 14.65	\$ 1,772.65
	618	2044	CONDT (RM) (3/4")	LF	647.00	\$ 11.25	\$ 7,278.75
	620	2011	ELEC CONDR (NO. 8) BARE	LF	8,023.00	\$ 1.00	\$ 8,023.00
	620	2012	ELEC CONDR (NO. 8) INSULATED	LF	16,046.00	\$ 1.05	\$ 16,848.30
	620	2015	ELEC CONDR (NO. 12) BARE	LF	647.00	\$ 0.85	\$ 549.95
	620	2016	ELEC CONDR (NO. 12) INSULATED	LF	1,294.00	\$ 0.90	\$ 1,164.60
	624	2014	GROUND BOX TY D (162922) W/APRON	EA	8.00	\$ 700.00	\$ 5,600.00
	628	2021	ELC SRV TY A 240/480 060 (SS)SS(E)GC(O)	EA	2.00	\$ 7,000.00	\$ 14,000.00
	628	2274	ELC SRV TY A 140/480 060 (NSE)SS(E)EX(O)	EA	1.00	\$ 4,080.00	\$ 4,080.00
	636	2002	ALUMINUM SIGNS (TY G)	SF	340.00	\$ 26.00	\$ 8,840.00
	644	2001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	19.00	\$ 365.00	\$ 6,935.00
	644	2002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	2.00	\$ 400.00	\$ 800.00
	644	2004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1.00	\$ 430.00	\$ 430.00
	644	2060	REMOVE SM RD SN SUP & AM	EA	15.00	\$ 115.00	\$ 1,725.00
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	1,981.70	\$ 3.25	\$ 6,440.53

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY	Williams Brothers	
TxDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES	Constructions	
ALT.	ITEM	DESC.				Co., INC.	
	NO.	CODE				Unit bid Price	Amount
	647	2003	REMOVE LRSA	EA	1.00	\$ 2,000.00	\$ 2,000.00
	658	2258	INSTL DEL ASSM (D-SW)SZ (TYC) CTB	EA	33.00	\$ 20.00	\$ 660.00
	658	2278	INSTL DEL ASSM (D-SY)SZ (TYC) CTB (BI)	EA	28.00	\$ 20.00	\$ 560.00
	662	2064	WK ZN PAV MRK REMOV (W) 4" (BRK)	LF	500.00	\$ 1.00	\$ 500.00
	662	2067	WK ZN PAV MRK REMOV (W) 4" (SLD)	LF	4,960.00	\$ 0.70	\$ 3,472.00
	662	2075	WK ZN PAV MRK REMOV (W) 8" (SLD)	LF	770.00	\$ 1.25	\$ 962.50
	662	2079	WK ZN PAV MRK REMOV (W) 24" (SLD)	LF	48.00	\$ 15.00	\$ 720.00
	662	2099	WK ZN PAV MRK REMOV 4" (Y) (SLD)	LF	3,790.00	\$ 0.70	\$ 2,653.00
	666	2003	REFL PAV MRK TY I (W) 4" (BRK)(100MIL)	LF	720.00	\$ 2.00	\$ 1,440.00
	666	2012	REFL PAV MRK TY I (W) 4" (SLD)(100MIL)	LF	40.00	\$ 5.00	\$ 200.00
	666	2036	REFL PAV MRK TY I (W) 8" (SLD)(100MIL)	LF	3,997.00	\$ 1.00	\$ 3,997.00
	666	2048	REFL PAV MRK TY I (W) 24" (SLD)(100MIL)	LF	89.00	\$ 15.00	\$ 1,335.00
	666	2093	REFL PAV MRK TY I (W) (UTURN ARW)(100MIL)	EA	2.00	\$ 125.00	\$ 250.00
	666	2096	REFL PAV MRK TY I (W) (WORD)(100MIL)	EA	2.00	\$ 125.00	\$ 250.00
	666	2099	REFL PAV MRK TY I (W) 18" (YLD TRI)(100MIL)	EA	13.00	\$ 32.00	\$ 416.00
	666	2111	REFL PAV MRK TY I (Y) 4" (SLD)(100MIL)	LF	420.00	\$ 1.00	\$ 420.00
	666	2189	PAVEMENT SEALER 4"	LF	1,180.00	\$ 0.12	\$ 141.60
	666	2191	PAVEMENT SEALER 8"	LF	3,997.00	\$ 0.20	\$ 799.40
	666	2195	PAVEMENT SEALER 24"	LF	89.00	\$ 1.00	\$ 89.00
	666	2220	PAVEMENT SEALER (WORD)	EA	2.00	\$ 25.00	\$ 50.00
	666	2230	PAVEMENT SEALER UTURN ARROW	EA	2.00	\$ 25.00	\$ 50.00
	666	2257	PAVEMENT SEALER (YLD TRI)	EA	13.00	\$ 1.00	\$ 13.00
	672	2022	TRAFFIC BUTTON TY II-C-R	EA	238.00	\$ 4.00	\$ 952.00
	677	2001	ELIM EXT PAV MRK & MRKS (4")	LF	6,610.00	\$ 0.50	\$ 3,305.00
	678	2001	PAV SURF PREP FOR MRK (4")	LF	33,639.00	\$ 0.05	\$ 1,681.95
	678	2003	PAV SURF PREP FOR MRK (8")	LF	3,997.00	\$ 0.10	\$ 399.70
	678	2006	PAV SURF PREP FOR MRK (24")	LF	89.00	\$ 2.00	\$ 178.00
	678	2016	PAV SURF PREP FOR MRK (UTURN ARR)	EA	2.00	\$ 35.00	\$ 70.00
	678	2018	PAV SURF PREP FOR MRK (WORD)	EA	2.00	\$ 35.00	\$ 70.00
	678	2019	PAV SURF PREP FOR MRK (18") (YLD TRI)	EA	13.00	\$ 12.00	\$ 156.00
	678	2037	PAV SURF PREP FOR MRK (7")	LF	3,433.00	\$ 0.15	\$ 514.95
	1122	2004	ROCK FILTER DAMS (INSTALL) (TY4)	LF	580.00	\$ 40.00	\$ 23,200.00
	1122	2009	ROCK FILTER DAMS (REMOVE)	LF	580.00	\$ 11.00	\$ 6,380.00
	1122	2016	CONSTRUCTION EXISTS(INSTALL)(TY I)	SY	1,498.00	\$ 21.00	\$ 31,458.00
	1122	2019	CONSTRUCTION EXISTS(REMOVE)	SY	1,498.00	\$ 10.00	\$ 14,980.00
	1122	2037	TEMPORARY SEDIMENT CONTROL FENCE INSTALL	LF	2,710.00	\$ 2.00	\$ 5,420.00
	1122	2047	BIOGRD EROSN CONT LOGS (8" DIA) INSTALL	LF	3,485.00	\$ 6.00	\$ 20,910.00
	1122	2056	BIODEGRADBLE EROSION CONTROL LOGS REMOV	LF	3,485.00	\$ 1.00	\$ 3,485.00
	1122	2057	TEMPORARY SEDIMENT CONTROL FENCE REMOVE	LF	2,710.00	\$ 1.00	\$ 2,710.00
	3061	2004	FAST TRAK CONC(CONT REINF HY STL)(13")	SY	518.00	\$ 95.00	\$ 49,210.00
	3268	2043	D-GR HMA TY-D (PG70-22)	TON	224.00	\$ 105.00	\$ 23,520.00
	6055	2001	IN-LANE OR TRANSVERSE RUMBLE STRIP	LF	80.00	\$ 15.00	\$ 1,200.00
	6834	2002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4.00	\$ 1,000.00	\$ 4,000.00
	6986	2006	PREFB PV MK W/WNTY TY B (W) (6") (SLD)	LF	16,289.00	\$ 3.15	\$ 51,310.35
	6986	2007	PREFB PV MK W/WNTY TY B (W) (9") (BRK) CNTST	LF	3,433.00	\$ 5.75	\$ 19,739.75
	6986	2016	PREFB PV MK W/WNTY TY B (Y) (6") (SLD)	LF	16,170.00	\$ 3.15	\$ 50,935.50
			FORCE ACCOUNT POLICE OFFICER	LS	1.00	\$ 118,663.00	\$ 118,663.00
TOTALS							\$ 30,353,132.89

FORT BEND PARKWAY TOLL ROAD AUTHORITY
FORT BEND PARKWAY TOLL ROAD
SH 6 CROSSING
FROM 0.59 MILES NORTH OF SH 6 TO 0.38 MILES SOUTH OF SH 6

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TxDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	100	2002	PREPARING R.O.W. _____ DLRS. and _____ CENTS	STA	63.50
	104	2001	REMOVING CONC (PAV) _____ DLRS. and _____ CENTS	SY	986.00
	104	2009	REMOVE CONC (RIPRAP) _____ DLRS. and _____ CENTS	SY	50.00
	104	2021	REMOVING CONC (CURB) _____ DLRS. and _____ CENTS	LF	2,178.00
	105	2014	REMOVING STAB BASE & ASPH PAV (7"-12") _____ DLRS. and _____ CENTS	SY	10,866.00
	110	2001	EXCAVATION(ROADWAY) _____ DLRS. and _____ CENTS	CY	9,582.00
	110	2002	EXCAVATION (CHANNEL) _____ DLRS. and _____ CENTS	CY	15,736.00
	132	2006	EMBANKMENT(FINAL)(DENS CONT)(TY C) _____ DLRS. and _____ CENTS	CY	43,749.00
	132	2036	EMBANK(FINAL)(DC)(TY E)(CSBE) _____ DLRS. and _____ CENTS	CY	3,821.00
	132	2037	EMBANK(FNL)(DC)(TY E)(CSBE)(RWALL FND IMPR) _____ DLRS. and _____ CENTS	CY	1,738.90
	162	2002	BLOCK SODDING _____ DLRS. and _____ CENTS	SY	112,335.00
	162	2003	STRAW OR HAY MULCH _____ DLRS. and _____ CENTS	SY	112,335.00
	164	2051	DRILL SEED (TEMP)(WARM OR COOL) _____ DLRS. and _____ CENTS	SY	112,335.00
	166	2001	FERTILIZER _____ DLRS. and _____ CENTS	AC	23.20
	168	2001	VEGETATIVE WATERING _____ DLRS. and _____ CENTS	MG	2,785.20
	260	2006	LIME TRT(EXST MATL)(6") _____ DLRS. and _____ CENTS	SY	36,215.00

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	260	2012	LIME (HYD, COM OR QK)(SLRY) OR QK(DRY) _____ DLRS. and _____ CENTS	TON	488.70
	276	2224	CEM TRT(PLNT MX)(CL N)(TY E)(GR 4)(6") _____ DLRS. and _____ CENTS	SY	36,215.00
	292	2007	ASPHALT STAB BASE (GR 2) (PG 64) _____ DLRS. and _____ CENTS	TON	746.00
	292	2017	ASPHALT STAB BASE(GR 4)(PG 64) _____ DLRS. and _____ CENTS	TON	1,991.90
	360	2003	CONC PVMT(CONT REINF-CRCP)(10") _____ DLRS. and _____ CENTS	SY	12,006.00
	360	2004	CONC PVMT(CONT REINF-CRCP)(11") _____ DLRS. and _____ CENTS	SY	21,471.00
	368	2001	WIDE FLANGE PAVEMENT TERMINALS _____ DLRS. and _____ CENTS	LF	174.84
	400	2001	STRUCT EXCAV _____ DLRS. and _____ CENTS	CY	3,004.90
	400	2005	CEM STABILIZED BACKFILL _____ DLRS. and _____ CENTS	CY	2,386.70
	400	2016	CEMENT STAB BACKFILL (INLET OR MH) _____ DLRS. and _____ CENTS	CY	380.80
	402	2001	TRENCH EXCAVATION PROTECTION _____ DLRS. and _____ CENTS	LF	4,215.00
	403	2001	TEMPORARY SPL SHORING _____ DLRS. and _____ CENTS	SF	2,348.00
	416	2004	DRILL SHAFT (36 IN) _____ DLRS. and _____ CENTS	LF	1,276.00
	416	2008	DRILL SHAFT (60 IN) _____ DLRS. and _____ CENTS	LF	3,816.00
	416	2012	DRILL SHAFT (84 IN) _____ DLRS. and _____ CENTS	LF	1,617.00
	416	2015	DRILL SHAFT (NON-REINFORCED)(12 IN) _____ DLRS. and _____ CENTS	LF	32.00
	<u>416</u>	<u>2018</u>	<u>DRILL SHAFT (SIGN MTS)(24 IN)</u> _____ DLRS. and _____ CENTS	<u>LF</u>	<u>26.00</u>

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	416	2029	DRILL SHALT (RDWY ILL POLE) (30 IN) _____ DLRS. and _____ CENTS	LF	104.00
	416	2038	DRILL SHAFT (108 IN) _____ DLRS. and _____ CENTS	LF	540.00
	416	2047	DRILL SHAFT (96 IN) _____ DLRS. and _____ CENTS	LF	741.00
	416	2051	DRILL SHAFT (120 IN) _____ DLRS. and _____ CENTS	LF	1,599.00
	420	2003	CL C CONC (ABUT) _____ DLRS. and _____ CENTS	CY	85.80
	420	2018	CL C CONC (FOOTING)(MASS PLACEMENT) _____ DLRS. and _____ CENTS	CY	1,183.11
	420	2019	CL C CONC (CAP) _____ DLRS. and _____ CENTS	CY	2,544.20
	420	2055	CL C CONC (COLUMN)(MASS PLACEMENT) _____ DLRS. and _____ CENTS	CY	3,636.00
	420	2221	CL S CONC (JUNCTION BOX)	CY	36.50
	422	2001	REINF CONC SLAB _____ DLRS. and _____ CENTS	SF	265,822.00
	423	2004	REATAINING WALL (MSE)(FRAC FIN) _____ DLRS. and _____ CENTS	SF	18,478.00
	425	2068	PRESTR CONC GIRDER (TY TX54) _____ DLRS. and _____ CENTS	LF	25,818.28
	432	2001	RIPRAP (CONC)(4 IN) _____ DLRS. and _____ CENTS	CY	6.00
	432	2039	RIPRAP(MOW STRIP)(4 IN) _____ DLRS. and _____ CENTS	CY	37.20
	432	2084	RIPRAP (CONC)(CL B)(4") _____ DLRS. and _____ CENTS	CY	150.90
	434	2033	ELASTOMERIC BEAR (E7) _____ DLRS. and _____ CENTS	EA	11.00
	434	2072	ELASTOMERIC BEAR (F7) _____ DLRS. and _____ CENTS	EA	11.00
	434	2077	ELASTOMERIC BEAR (ES4) _____ DLRS. and _____ CENTS	EA	11.00

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	434	2087	ELASTOMERIC BEAR (EE4) _____ DLRS. and _____ CENTS	EA	11.00
	442	2002	STR STL (PLATE GIRDER) _____ DLRS. and _____ CENTS	LB	3,509,621.00
	442	2048	STRUCTURAL STEEL (MISC NON-BRIDGE) _____ DLRS. and _____ CENTS	LB	836.00
	450	2013	RAIL(TY SSTR) _____ DLRS. and _____ CENTS	LF	7,296.60
	450	2109	RAIL(TY SSTR) W/DRAIN SLOTS _____ DLRS. and _____ CENTS	LF	2,156.00
	454	2001	SEAL EXPANSION JOINT (4 IN) (SEJ-A) _____ DLRS. and _____ CENTS	LF	870.00
	462	2002	CONC BOX CULV (3 FT X 3 FT) _____ DLRS. and _____ CENTS	LF	30.00
	464	2003	RC PIPE(CL III)(18 IN) _____ DLRS. and _____ CENTS	LF	673.00
	464	2005	RC PIPE(CL III)(24 IN) _____ DLRS. and _____ CENTS	LF	2,943.00
	464	2007	RC PIPE(CL III)(30 IN) _____ DLRS. and _____ CENTS	LF	310.00
	464	2009	RC PIPE (CL III)(36 IN) _____ DLRS. and _____ CENTS	LF	244.00
	464	2010	RC PIPE (CL III)(42 IN) _____ DLRS. and _____ CENTS	LF	115.00
	464	2011	RC PIPE (CL III)(48 IN) _____ DLRS. and _____ CENTS	LF	228.00
	464	2036	RC PIPE (CL V)(24 IN) _____ DLRS. and _____ CENTS	LF	76.00
	465	2001	INLET (COMPL)(TY C) _____ DLRS. and _____ CENTS	EA	11.00
	465	2010	INLET (COMPL) (TY AAD) _____ DLRS. and _____ CENTS	EA	4.00
	465	2013	MANH (COMPL) (TY A) _____ DLRS. and _____ CENTS	EA	7.00

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	465	2104	INLET EXT _____ DLRS. and _____ CENTS	EA	6.00
	465	2119	INLET(COMPL)(TY AZ) _____ DLRS. and _____ CENTS	EA	16.00
	465	2120	INLET (COMPL)(TY AZR) _____ DLRS. and _____ CENTS	EA	1.00
	465	2255	INLET(COMPL)(TY AZ2G) _____ DLRS. and _____ CENTS	EA	4.00
	467	2023	SET (TY I)(S=3 FT)(HW=3 FT)(3:1)C _____ DLRS. and _____ CENTS	EA	1.00
	467	2211	SET (TY II) (24 IN) (RCP) (3:1) (P) C _____ DLRS. and _____ CENTS	EA	3.00
	467	2213	SET (TY II) (30 IN) (RCP) (3:1) (P) C _____ DLRS. and _____ CENTS	EA	1.00
	467	2216	SET (TY II) (42 IN) (RCP) (3:1) (P) C _____ DLRS. and _____ CENTS	EA	1.00
	467	2217	SET (TY II) (48 IN) (RCP) (3:1) (P) C _____ DLRS. and _____ CENTS	EA	1.00
	467	2224	SET(TY II)(24 IN)(RCP)(4:1) (C) _____ DLRS. and _____ CENTS	EA	3.00
	471	2007	GRATE AND FRAME (BRIDGE DRAIN) _____ DLRS. and _____ CENTS	EA	50.00
	476	2005	JACK BOR OR TUN PIPE (42 IN)(RC)(CL III) _____ DLRS. and _____ CENTS	LF	84.00
	496	2002	REMOV STR (INLET) _____ DLRS. and _____ CENTS	EA	1.00
	496	2007	REMOV STR (PIPE) _____ DLRS. and _____ CENTS	LF	144.00
	496	2008	REMOV STR (BOX CULVERT) _____ DLRS. and _____ CENTS	LF	72.00
	500	2001	MOBILIZATION _____ DLRS. and _____ CENTS	LS	1.00
	502	2001	BARRICADES, SIGNS AND TRAFFIC HANDLING _____ DLRS. and _____ CENTS	MO	20.00
	512	2008	PORT CTB(FUR & INST)(LOW PROF)(TY I) _____ DLRS. and _____ CENTS	LF	980.00

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	512	2009	PORT CTB(FUR & INST)(LOW PROF)(TY2) _____ DLRS. and _____ CENTS	LF	40.00
	512	2026	PORT CTB(MOVE)(LOW PROF)(TY 1) _____ DLRS. and _____ CENTS	LF	300.00
	512	2027	PORT CTB(MOVE)(LOW PROF)(TY 2) _____ DLRS. and _____ CENTS	LF	20.00
	512	2040	PORT CTB (REMOVE)(SNGL SLP)(TY 1) _____ DLRS. and _____ CENTS	LF	102.00
	512	2044	PORT CTB (REMOVE)(LOW PROF)(TY 1) _____ DLRS. and _____ CENTS	LF	1,780.00
	512	2045	PORT CTB (REMOVE)(LOW PROF)(TY 2) _____ DLRS. and _____ CENTS	LF	80.00
	512	2060	PORT CTB (MOVE)(SNGL-SLP)(TY J-J) _____ DLRS. and _____ CENTS	LF	540.00
	512	2062	PORT CTB (REMOVE)(SNGLE SLP)(TYP J-J) _____ DLRS. and _____ CENTS	LF	1,792.00
	514	2004	PERM CONC TRF BARR (SGL SLP)(TY 1)(42") _____ DLRS. and _____ CENTS	LF	4,971.00
	514	2022	PERM CONC TRF BARR (SGL SLP)(TY 4)(42") _____ DLRS. and _____ CENTS	LF	250.00
	529	2006	CONC CURB(MONO)(TY II) _____ DLRS. and _____ CENTS	LF	5,231.00
	529	2007	CONC CURB (DOWEL) _____ DLRS. and _____ CENTS	LF	994.00
	529	2070	CONCRETE CURB (TYPE U-TURN)(SPECIAL) _____ DLRS. and _____ CENTS	LF	392.00
	545	2022	CRASH CUSH ATTEN(INSTL)(REACT)(N) _____ DLRS. and _____ CENTS	EA	2.00
	610	2025	INS RD IL AM (TY SA) 40T-8-8 (.25 KW) S _____ DLRS. and _____ CENTS	EA	1.00
	610	2045	INS RD IL AM (TY SP) 38S-8-8 (.25KW)S _____ DLRS. and _____ CENTS	EA	25.00
	610	2060	INS RD IL AM (U/P) (TY I) (.15 KW) S _____ DLRS. and _____ CENTS	EA	11.00

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	610	2064	RELOCATE RD IL ASM (TRANS-BASE) _____ DLRS. and _____ CENTS	EA	12.00
	618	2034	CONDT (PVC) (SCHD 80) (2") _____ DLRS. and _____ CENTS	LF	2,899.00
	618	2035	CONDT (PVC) (SCHD 80) (2") (BORE) _____ DLRS. and _____ CENTS	LF	121.00
	618	2044	CONDT (RM) (3/4") _____ DLRS. and _____ CENTS	LF	647.00
	620	2011	ELEC CONDR (NO. 8) BARE _____ DLRS. and _____ CENTS	LF	8,023.00
	620	2012	ELEC CONDR (NO. 8) INSULATED _____ DLRS. and _____ CENTS	LF	16,046.00
	620	2015	ELEC CONDR (NO. 12) BARE _____ DLRS. and _____ CENTS	LF	647.00
	620	2016	ELEC CONDR (NO. 12) INSULATED _____ DLRS. and _____ CENTS	LF	1,294.00
	624	2014	GROUND BOX TY D (162922) W/APRON _____ DLRS. and _____ CENTS	EA	8.00
	628	2021	ELC SRV TY A 240/480 060 (SS)SS(E)GC(O) _____ DLRS. and _____ CENTS	EA	2.00
	628	2274	ELC SRV TY A 140/480 060 (NSE)SS(E)EX(O) _____ DLRS. and _____ CENTS	EA	1.00
	636	2002	ALUMINUM SIGNS (TY G) _____ DLRS. and _____ CENTS	SF	340.00
	644	2001	IN SM RD SN SUP&AM TY10BWG(1)SA(P) _____ DLRS. and _____ CENTS	EA	19.00
	644	2002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM) _____ DLRS. and _____ CENTS	EA	2.00
	644	2004	IN SM RD SN SUP&AM TY10BWG(1)SA(T) _____ DLRS. and _____ CENTS	EA	1.00
	644	2060	REMOVE SM RD SN SUP & AM _____ DLRS. and _____ CENTS	EA	15.00
	647	2001	INSTALL LRSS (STRUCT STEEL) _____ DLRS. and _____ CENTS	LB	1,981.70
	647	2003	REMOVE LRSA _____ DLRS. and _____ CENTS	EA	1.00

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	658	2258	INSTL DEL ASSM (D-SW)SZ (TYC) CTB DLRS. and CENTS	EA	33.00
	658	2278	INSTL DEL ASSM (D-SY)SZ (TYC) CTB (BI) DLRS. and CENTS	EA	28.00
	662	2064	WK ZN PAV MRK REMOV (W) 4" (BRK) DLRS. and CENTS	LF	500.00
	662	2067	WK ZN PAV MRK REMOV (W) 4" (SLD) DLRS. and CENTS	LF	4,960.00
	662	2075	WK ZN PAV MRK REMOV (W) 8" (SLD) DLRS. and CENTS	LF	770.00
	662	2079	WK ZN PAV MRK REMOV (W) 24" (SLD) DLRS. and CENTS	LF	48.00
	662	2099	WK ZN PAV MRK REMOV 4" (Y) (SLD) DLRS. and CENTS	LF	3,790.00
	666	2003	REFL PAV MRK TY I (W) 4" (BRK)(100MIL) DLRS. and CENTS	LF	720.00
	666	2012	REFL PAV MRK TY I (W) 4" (SLD)(100MIL) DLRS. and CENTS	LF	40.00
	666	2036	REFL PAV MRK TY I (W) 8" (SLD)(100MIL) DLRS. and CENTS	LF	3,997.00
	666	2048	REFL PAV MRK TY I (W) 24" (SLD)(100MIL) DLRS. and CENTS	LF	89.00
	666	2093	REFL PAV MRK TY I (W) (UTURN ARW)(100MIL) DLRS. and CENTS	EA	2.00
	666	2096	REFL PAV MRK TY I (W) (WORD)(100MIL) DLRS. and CENTS	EA	2.00
	666	2099	REFL PAV MRK TY I (W) 18" (YLD TRI)(100MIL) DLRS. and CENTS	EA	13.00
	666	2111	REFL PAV MRK TY I (Y) 4" (SLD)(100MIL) DLRS. and CENTS	LF	420.00
	666	2189	PAVEMENT SEALER 4" DLRS. and CENTS	LF	1,180.00

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	666	2191	PAVEMENT SEALER 8" _____ DLRS. and _____ CENTS	LF	3,997.00
	666	2195	PAVEMENT SEALER 24" _____ DLRS. and _____ CENTS	LF	89.00
	666	2220	PAVEMENT SEALER (WORD) _____ DLRS. and _____ CENTS	EA	2.00
	666	2230	PAVEMENT SEALER UTURN ARROW _____ DLRS. and _____ CENTS	EA	2.00
	666	2257	PAVEMENT SEALER (YLD TRI) _____ DLRS. and _____ CENTS	EA	13.00
	672	2022	TRAFFIC BUTTON TY II-C-R _____ DLRS. and _____ CENTS	EA	238.00
	677	2001	ELIM EXT PAV MRK & MRKS (4") _____ DLRS. and _____ CENTS	LF	6,610.00
	678	2001	PAV SURF PREP FOR MRK (4") _____ DLRS. and _____ CENTS	LF	33,639.00
	678	2003	PAV SURF PREP FOR MRK (8") _____ DLRS. and _____ CENTS	LF	3,997.00
	678	2006	PAV SURF PREP FOR MRK (24") _____ DLRS. and _____ CENTS	LF	89.00
	678	2016	PAV SURF PREP FOR MRK (UTURN ARR) _____ DLRS. and _____ CENTS	EA	2.00
	678	2018	PAV SURF PREP FOR MRK (WORD) _____ DLRS. and _____ CENTS	EA	2.00
	678	2019	PAV SURF PREP FOR MRK (18") (YLD TRI) _____ DLRS. and _____ CENTS	EA	13.00
	678	2037	PAV SURF PREP FOR MRK (7") _____ DLRS. and _____ CENTS	LF	3,433.00
	1122	2004	ROCK FILTER DAMS (INSTALL) (TY4) _____ DLRS. and _____ CENTS	LF	580.00
	1122	2009	ROCK FILTER DAMS (REMOVE) _____ DLRS. and _____ CENTS	LF	580.00

COUNTY: FORT BEND			PROPOSAL SHEET	AUTH	USE ONLY
TXDOT ITEM-CODE			UNIT BID PRICE ONLY,	UNIT	APPROX. QUANTITIES
ALT.	ITEM NO.	DESC. CODE			
	1122	2016	CONSTRUCTION EXISTS(INSTALL)(TY I) _____ DLRS. and _____ CENTS	SY	1,498.00
	1122	2019	CONSTRUCTION EXISTS(REMOVE) _____ DLRS. and _____ CENTS	SY	1,498.00
	1122	2037	TEMPORARY SEDIMENT CONTROL FENCE INSTALL _____ DLRS. and _____ CENTS	LF	2,710.00
	1122	2047	BIOGRD EROSN CONT LOGS (8" DIA) INSTALL _____ DLRS. and _____ CENTS	LF	3,485.00
	1122	2056	BIODEGRADBLE EROSION CONTROL LOGS REMOV _____ DLRS. and _____ CENTS	LF	3,485.00
	1122	2057	TEMPORARY SEDIMENT CONTROL FENCE REMOVE _____ DLRS. and _____ CENTS	LF	2,710.00
	3061	2004	FAST TRAK CONC(CONT REINF HY STL)(13") _____ DLRS. and _____ CENTS	SY	518.00
	3268	2043	D-GR HMA TY-D (PG70-22) _____ DLRS. and _____ CENTS	TON	224.00
	6055	2001	IN-LANE OR TRANSVERSE RUMBLE STRIP _____ DLRS. and _____ CENTS	LF	80.00
	6834	2002	PORTABLE CHANGEABLE MESSAGE SIGN _____ DLRS. and _____ CENTS	EA	4.00
	6986	2006	PREFB PV MK W/WNTY TY B (W) (6") (SLD) _____ DLRS. and _____ CENTS	LF	16,289.00
	6986	2007	PREFB PV MK W/WNTY TY B (W) (9") (BRK) CNTST _____ DLRS. and _____ CENTS	LF	3,433.00
	6986	2016	PREFB PV MK W/WNTY TY B (Y) (6") (SLD) _____ DLRS. and _____ CENTS	LF	16,170.00
			FORCE ACCOUNT POLICE OFFICER One hundred eighteen thousand six hundreds sixty three _____ DLRS. and zero _____ CENTS	LS	1.00

SALES TAX EXEMPTION

NOTICE TO CONTRACTORS

The Contractor's attention is directed to TEX. TAX CODE ANN. 151.311, which was amended by the Texas Legislature, effective October 1, 1993.

Under Section 151.311, as amended, tangible personal property purchased by a contractor for use in the performance of a contract for the improvement of real property for an organization such as Fort Bend County Toll Road Authority (FBCTRA) is exempt from the payment of sales and use tax thereon when the property is incorporated into the realty in the performance of the contract. Building materials, etc., are exempt from tax if they are: (1) necessary and essential for the performance of the contract; and (2) completely consumed at the job site (i.e., after being used once for their intended purpose they are used up or destroyed). Items that can be re-used on other jobs are not tax exempt.

Services purchased by a contractor are also tax exempt, where: (1) the contract is for an improvement to real estate for an exempt organization; and (2) the contract expressly requires the specific service to be provided or purchased by the person performing the contract; or (3) the service is integral to the performance of the contract.

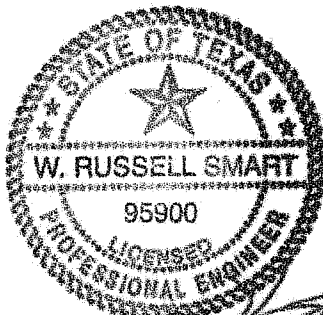
Machinery and equipment, including repair and replacement parts for the same, are not tax exempt when used in the performance of a contract for the improvement of real estate for FBCTRA.

The Contractor should be aware that the Texas Comptroller of Public Accounts issues rules interpreting applicable provisions of the tax code from time to time. The rules should be consulted when answering specific questions. The Contractor can obtain additional information concerning the applicable sales and use tax, as well as sales tax permits and information regarding resale certificates, from the State Comptroller's Office, at (800) 252-5555.

Highway: Fort Bend Parkway Toll Road: SH 6 Crossing
Limits: From 0.59 Miles North of SH 6 to 0.38 Miles
South of SH 6
County: Fort Bend

The enclosed Texas Department of Transportation 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(s).

NOTE: For the purpose of constructing this Proposal and the attached form of Contract, the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, as adopted by the Texas Department of Transportation on June 1, 2004, hereinafter referred to are approved and incorporated herein by reference for all purposes by the Fort Bend County Toll Road Authority as official specifications, together with and to be modified by the Special Provisions and Special Specifications as are listed herein.



W. Russell Smart, PE
10/27/14

W. Russell Smart
Parsons Brinckerhoff
Project Manager

Date: *10/27/14*

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

GENERAL NOTES:

General:

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.

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 7.7 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.

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

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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.

Contractor's attention is directed to the information related to the water table for the detention pond area and installation of bridge substructure and storm sewer work within the pond areas. No additional compensation will be provided for dewatering.

Contractor is responsible for all tolls. The authority will not provide reimbursement for toll charges.

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 TxDOT 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 Department 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 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 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 Engineer.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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 equal:

Tricycle Type

Wayne Series 900

Elgin White Wing

Elgin Pelican

Truck Type - 4 Wheel

M-B Cruiser II

Wayne Model 945

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.

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

CTMS boards shall be provided one week prior to closure.

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.

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 Fort Bend Toll Road Authority.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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 standard sheets.

Item 5: Control of the Work

Before contract letting, electronically generated earthwork cross-section data will be furnished free of charge to the prospective bidders on a compact high-density disk, in an ASCII print format. This will be available through the board service or through the Engineer's office. If the earthwork data is not available electronically, reproducible earthwork cross sections are available at the Engineer's office for borrowing by copying service companies for the purpose of making copies for the prospective bidders, at the prospective bidder's expense. The earthwork cross-section data provided above is for non-construction purposes only and it is the responsibility of the prospective bidder to validate the enclosed 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 below. References to 11 in. x 17 in. sheets in individual specifications for structural items imply electronic CAD sheets.

Table 1
2004 Construction Specification Required Shop/Working Drawing Submittals

Spec Item No.'s	Product	Submittal Required	Approval Required (Y/N)	Contractor/Fabricator P.E. Seal Required
7.8	Construction Load Analyses	Y	Y	Y
400	Excavation and Backfill for Structures (cofferdams)	Y	N	Y
403	Temporary Special Shoring	Y	N	Y
420	Formwork/Falsework	Y	N	Y
423	Retaining Walls, (calcs req'd.)	Y	Y	Y
425	Optional Design Calculations (Prstrs Bms)	Y	Y	Y
425	Prestr Concr Sheet Piling	Y	Y	N
425	Prestr Concr Beams	Y	Y	N
425	Prestr Concr Bent	Y	Y	N
426	Post Tension Details	Y	Y	N
434	Elastomeric Bearing Pads (All)	Y	Y	N
441	Bridge Protective Assembly	Y	Y	N
441	Misc Steel (various steel assemblies)	Y	Y	N
441	Steel Pedestals (bridge raising)	Y	Y	N
441	Steel Bearings	Y	Y	N
441	Steel Bent	Y	Y	N
441	Steel Diaphragms	Y	Y	N
441	Steel Finger Joint	Y	Y	N
441	Steel Plate Girder	Y	Y	N
441	Steel Tub-Girders	Y	Y	N
441	Erection Plans	Y	N	Y
449	Sign-Structure Anchor Bolts	Y	Y	N
450	Railing	Y	Y	N

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

462	Concrete Box Culvert	Y	Y	N
462	Concrete Box Culvert (Alternate Designs Only, calcs reqd.)	Y	Y	Y
464	Reinforced Concrete Pipe (Jack and Bore only; ONLY when requested)	Y	Y	Y
465	Pre-cast Junction Boxes, Grates, and Inlets	Y	Y	N
465	Pre-cast Junction Boxes, Grates, and Inlets (Alternate Designs Only, calcs req'd.)	Y	Y	Y
466	Pre-cast Headwalls and Wingwalls	Y	Y	N
467	Pre-cast Safety End Treatments	Y	Y	N
495	Raising Existing Structure (calcs reqd.)	Y	Y	Y
610	Roadway Illumination Supports (Non-Standard only, calcs reqd.)	Y	Y	Y
613	High Mast Illumination Poles (Non-standard only, calcs reqd.)	Y	Y	Y
627	Treated Timber Poles	Y	Y	N
644	Special Non-Standard Supports (Bridge Mounts, Barrier Mounts, Etc.)	Y	Y	Y
647	Large Roadside Sign Supports	Y	Y	Y
650	Cantilever Sign Structure Supports - Alternate Design Calcs.	Y	Y	Y
650	Sign Structures	Y	Y	N
652	Highway Sign Lighting Fixtures	Y	Y	N
654	Sign Walkways	Y	Y	N
680	Installation of Highway Traffic Signals	Y	Y	N
682	Vehicle and Pedestrian Signal Heads	Y	Y	N
684	Traffic Signal Cables	Y	Y	N
685	Roadside Flashing Beacon Assemblies	Y	Y	N
686	Traffic Signal Pole Assemblies (Steel) (Non-Standard only)	Y	Y	Y
687	Pedestal Pole Assemblies	Y	Y	N
688	Detectors	Y	Y	N
784	Repairing Steel Bridge Members	Y	Y	Y
SS	Prestr Concr Crown Span	Y	Y	N
SS	Sound Barrier Walls	Y	Y	N
SS	Camera Poles	Y	Y	Y
SS	Pedestrian Bridge (Calcs req'd.)	Y	Y	Y
SS	Screw-In Type Anchor Foundations	Y	Y	N
SS	Fiber Optic/Communication Cable	Y	Y	N
SS	Spread Spectrum Radios for Signals	Y	Y	N
SS	VIVDS System for Signals	Y	Y	N
SS	CTMS Equipment	Y	Y	N

Item 7: Legal Relations and Responsibilities

Do not initiate activities in a Project Specific Location (PSL), associated with a U.S. Army Corps of Engineers (USACE) permit area, that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include those pertaining to, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here means materials are delivered to or from the PSL. The permit area includes the waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. Assume responsibility for consultations with the

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

USACE regarding activities, including PSLs that have not been previously evaluated by the USACE. Provide the Department with a copy of consultations or approvals from the USACE before initiating activities.

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

Document and coordinate with the USACE, if required, before hauling any excavation from or hauling any embankment to a USACE permit area by either 1 or 2 below:

1. Restricted Use of Materials for the Previously Evaluated Permit Areas.

Document both the Project Specific Locations (PSL) and their authorization. Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:

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

2. Contractor Materials from Areas Other than Previously Evaluated Areas.

Provide the Department with a copy of USACE coordination or approvals before initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites:

- a. The Item, "Embankment" used for temporary or permanent fill within a USACE permit area.
- b. Unsuitable excavation or excess excavation, "Waste" (under the Item, "Excavation"), that is disposed of outside a USACE evaluated area.

The total area disturbed for this project is 27.5 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 Contractor will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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.

Maintain the roadway slope stability. Maintaining slope stability is subsidiary to the various bid items.

The nesting / breeding season for migratory birds is March 1 through August 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 Engineer. Obtain this approval well in advance of the planned use. The cost of this work is subsidiary to the various bid items.

Item 8: Prosecution and Progress

No lane closures are allowed the day before, during, and day after the seven National Holidays unless otherwise approved by the Engineer.

The Contractor must achieve Substantial Completion within 404 calendar days. Substantial completion is considered to be completion, in the opinion of the Engineer, of all required permanent and temporary construction, striping, safety devices, signage and incidentals in order to open all lanes of traffic.

Failing to achieve Substantial Completion within the days specified by the Engineer the Contractor will be assessed liquidated damages of \$7,000 per day which will be withheld from any amount owed the Contractor. If the amount owed the Contractor is insufficient to withhold the amount, the Contractor shall pay the difference to the Authority

The Contractor must achieve Final Completion no more than 30 calendar days after the date of Substantial Completion.

Failing to achieve Final Completion within the days specified by the Engineer the Contractor will be assessed liquidated damages of \$3,500 per day which will be withheld from any amount owed the Contractor. If the amount owed the Contractor is insufficient to withhold the amount, the Contractor shall pay the difference to the Authority.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

The 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 calendar days.

Provide a virus-free computer disk or diskette containing the Primavera construction schedule.

The Lane Closure Assessment Fee is \$4000. 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."

Item 100: Preparing Right of Way

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 Authority.

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 Stabilized Base and Asphalt Pavement

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

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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.

The total excavation quantity shown on the plans includes the quantity for excavating to 2 ft. behind the back of the proposed curb.

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.

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” standard sheet for material specifications, application rates, and for watering requirements.

Item 204: Sprinkling

Perform subsidiary sprinkling as required under various other items in accordance with the Item, “Sprinkling.”

Sprinkling for dust control is subsidiary to the various bid items.

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

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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.C.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 pugmill 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.C, "Compaction." Place the courses in the same working day unless otherwise approved.

If using a 100 percent crushed stone aggregate for the proposed base or other aggregate, it must contain 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

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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. 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,

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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)

Item 3268: Dense-Graded Hot Mix Asphalt

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.

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.

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)

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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. The minimum stability in accordance with TEX-208-F is 30 percent with a laboratory molded density of 96 percent plus or minus 1.5 percent.

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.E, "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 a minimum of 25 percent by weight of Class F Fly Ash.

Perform saw cutting as shown on the plans in accordance with Section 360.4.J, "Sawing Joints." This saw cutting is subsidiary to this bid Item.

Use coarse aggregate to produce concrete with a Coefficient of Thermal Expansion (CTE) of less than 6.0×10^{-6} in/in/°F. Before construction, submit test specimens to the Engineer for aggregate acceptance. Provide samples or test specimens as directed. The Engineer will perform the testing. Test results are final. Testing is required for naturally occurring aggregates.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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

Items 360 and 420: All Concrete 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 Structures

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.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

Item 423: Retaining Walls

Use fractured fin finish.

Place concrete riprap mow strips for retaining walls as shown on the plans and in accordance with the Item, "Riprap." Use Class B concrete reinforced with No. 4 bars spaced at 18 in. centers each direction and placed 2 in. below the surface. This work is paid for under the Item, "Riprap."

Provide and maintain positive drainage away from the earth wall system, including the leveling pad, for the contract duration.

Approved Mechanically Stabilized Earth (MSE) Wall Systems are listed at the website below:

http://www.dot.state.tx.us/business/contractors_consultants/bridge/mse_wall.htm

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 450: Railing

Add a 3/4-in. longitudinal chamfer to the SSTR railing. Provide a continuous chamfer typically located 6 in. above the final grade. The cost of this is subsidiary to the Item, "Railing."

Item 462: Concrete Box Culverts and Storm Drains

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 Structures" 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 stubouts are shown on the plans, but these stubouts 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.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

The flowline elevations of side road structures are based on the proposed ditches. Field-verify these elevations and adjust them 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: 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.

If building manholes or inlets in graded areas, first construct them 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 or inlets to the finished elevation when completing the grading work for such manholes or 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

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.

Submit changes to the traffic control plan to the Engineer. Provide a layout showing the construction phasing, signs, striping, and signalizations for changes to the original traffic control plan. Changes must be signed and sealed by a Texas Professional Engineer.

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

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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.

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.

Use shadow vehicles with Truck Mounted Attenuators (TMA) for lane closures during construction. Do not reduce the existing number of lanes open to traffic except during off-peak hours as approved by the Engineer. Peak hours are considered to be 6am – 8:30am, and 4:30pm – 7:00pm, Monday through Friday. The Engineer may approve other closure times if traffic counts warrant. The 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”, provided by the Authority 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.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

Full Closure (SH 6 Mainlane-For Beam Hanging)

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Monday	Not Allowed	12:00 AM – 5:00 AM 9:00 PM – 11:59 PM	5:00 AM – 9:00 PM
Tuesday	Not Allowed	12:00 AM – 5:00 AM 9:00 PM – 11:59 PM	5:00 AM – 9:00 PM
Wednesday	Not Allowed	12:00 AM – 5:00 AM 9:00 PM – 11:59 PM	5:00 AM – 9:00 PM
Thursday	Not Allowed	12:00 AM – 5:00 AM 9:00 PM – 11:59 PM	5:00 AM – 9:00 PM
Friday	Not Allowed	12:00 AM – 5:00 AM 9:00 PM – 11:59 PM	5:00 AM – 9:00 PM

A minimum of 7 days in advance of any total closure, notify the Authority 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.

Provide 4 portable changeable message signs, Special Specification Item, “Portable Changeable Message Signs,” that shall be used during closures of SH 6 main lanes and frontage roads. The number of days of use will be dependent on the Contractor’s operations.

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
Intersection of SH 6 and Fort Bend Toll Road	2 days/per closure
Knight Road	2 days/per closure

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

The intersection may be closed during a weekend from 9:00 P.M. on Friday to 5:00 A.M. on Monday.

Item 504: Field Office and Laboratory

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 in accordance with Department Material Specification DMS-10101, "Computer Equipment."

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 fire extinguisher and first aid kit. At a minimum, furnish 20 lb. fire extinguishers that are rated for Type A, B, and C fires.

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 529: Concrete Curb, Gutter, and Combined Curb and Gutter

An air-entraining admixture is not required.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

For concrete curbs, use Grade 7 aggregate conforming to Section 421.2 of the Item, "Hydraulic Cement Concrete."

Item 556: Pipe Underdrains

Do not use crushed blast furnace slag.

Lay the underdrain pipe on a slope to insure proper drainage.

Tie the under drain pipe into the inlets as shown on the plans.

If filter material is processed gravel, use the following material requirements:

Square Sieve	Percent Retained
1/2 in.	0
No. 4	10 - 35
No. 40	55 - 85

If filter material is approved concrete sand, use the following material requirements:

Square Sieve	Percent Retained
5/8 in.	0
No. 4	0 - 40
No. 40	40 - 90
No. 100	90 - 100

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 concrete or asphalt curb and gutter sections or frontage roads, use Surface Test Type B and Pay Adjustment Schedule 2 except for the outside lane. Use Surface Test Type B and Pay Adjustment Schedule 3 for the outside lane.

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.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

Fabricate steel roadway illumination poles in accordance with TxDOT Standard RIP-07 (Roadway Illumination Poles – 2007). Poles manufactured according to RIP-07 require no shop drawings. Alternate designs to RIP-07 or the use of aluminum to fabricate poles will require the submission of shop drawings electronically.

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

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.

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

Unless 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.

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

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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 in place of the cast iron junction boxes shown on standard sheets 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 TxDOT website for the list. The category is "Roadway Illumination and Electrical Supplies." The polymer concrete barrier box is subsidiary to Item 618, "Conduit."

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 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 Roadside Flashing Beacon Assemblies (Item 685) and Pedestal Pole Assemblies (Item 687) within the project, provide single-pole breakaway disconnects as shown on the Construction Division (CST) material producers list. Check the latest link on the Department website for this list. The category is "Roadway Illumination and Electrical Supplies." The fuse holder is shown on the list under Item 685. For underground (hot) conductors, install a breakaway connector with a dummy fuse (slug). Provide dummy fuse (slug). For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).

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.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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 (3), III, B, 4 through 6.

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 (3). 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: Aluminum Signs

When design details are 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 Supports and 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 Supports and 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.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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 signs.

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 647: Large Roadside Sign Supports and Assemblies

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.

Assume ownership of the removed existing signs.

Item 662: Work Zone Pavement Markings

At the end of each day's work, 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.

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 6986: Longitudinal Prefabricated Pavement Markings (PPM) with Warranty

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

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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 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.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

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.

Perform air blasting with a compressor that is capable of generating air at a minimum of 100 psi using 5/16 in. or larger hosing for the air blast (equipment should have sufficient capacity to remove contaminants but not damage the pavement surface). Do not clean concrete pavement by grinding.

Item 1122: 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. Contractor shall prepare and submit the NOI to the Texas Commission on Environmental Quality prior to commencing construction. Contractor will be responsible for application fees.

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 3268: Dense-Graded Hot Mix Asphalt

Taper the asphalt concrete pavement at the beginning and ending points.

Use a maximum 6H:1V slope for the asphalt concrete pavement edge.

Where the 6H:1V ACP edge taper extends over onto the unsurfaced shoulders, blade off the loose existing shoulder material to provide a solid base for the outside taper edge. After placing the ACP overlay, blade this material back against the edge taper. This work is subsidiary to the various bid items.

County: Fort Bend

Highway: Fort Bend Parkway Toll Road (SH 6 Crossing)

The stockpile will be the point of sampling of coarse aggregate for test method TEX-217-F (Part II, decantation).

Place the asphalt concrete pavement in courses as shown on the typical sections.

Do not use petroleum-based solvents in the beds of hot mix asphalt delivery vehicles.

Dilution of tack coat is not allowed.

Do not use Surface Aggregate Classification (SAC) C for this project.

For determining the Asphalt Content, only ignition ovens will be allowed.

Basis of Estimate

Item	Description	Limit and Rate	Unit
260	Lime Treatment (Road-Mixed) For materials used as subgrade * <ul style="list-style-type: none">• Lime(HYD, COM, or QK)(SLRY) or QK(DRY)	6 % by weight based on 100 Lb. / Cu. Ft. subgrade	SY TON
292	Asphalt Treatment (Plant-Mixed) <ul style="list-style-type: none">• Asphalt• Aggregate	110 Lb. / Sq. Yd.-In. 5 % by weight 95 % by weight	TON
3268	Dense-Graded Hot Mix Asphalt <ul style="list-style-type: none">• Asphalt• Aggregate	110 Lb. / Sq. Yd.-In. 6 % by weight 94 % by weight	TON

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

Fort Bend County Toll Road Authority

Fort Bend Parkway Toll Road at SH 6 Crossing

GOVERNING SPECIFICATIONS AND SPECIAL PROVISION

All Specifications and Special Provisions applicable to this project are identified as follows:

STANDARD SPECIFICATIONS

Adopted by the Texas Department of Transportation June 1, 2004. Standard Specifications are incorporated into the Contract by reference and a copy may be purchased from TxDOT.

Items 1 to 9	General Requirements and Covenants
Item 100	Preparing Right of Way
Item 104	Removing Concrete
Item 105	Removing Stabilized Base and Asphalt Pavement
Item 110	Excavation (132)
Item 132	Embankment (100)(204)(210)(216)(400)
Item 162	Sodding For Erosion Control (166)(168)
Item 164	Seeding For Erosion Control (162)(166)(168)
Item 166	Fertilizer
Item 168	Vegetative Watering
Item 260	Lime Treatment (Road-Mixed) (105)(132)(204)(210)(216)(247)(300)(310)(520)
Item 276	Cement Treatment (Plant-Mixed (204)(210)(216)(247)(300)(310)(520)
Item 292	Asphalt Treatment (Plant-Mixed) (300)(301)(320)(520)(585)
Item 360	Concrete Pavement (300)(420)(421)(438)(440)(529)(585)
Item 368	Concrete Pavement Terminals (247)(260)(276)(292)(300)(360)(400)(420)(421)(438)(440)(442)
Item 400	Excavation and Backfill for Structures (132)(401)(420)(421)
Item 402	Trench Excavation Protection

Item 403	Temporary Special Shoring (423)
Item 416	Drilled Shaft Foundations (420)(421)(440)(448)
Item 420	Concrete Structures (400)(421)(427)(438)(440)(448)
Item 422	Reinforced Concrete Slab (420)(421)(424)(426)(430)(440)
Item 423	Retaining Walls (110)(132)(400)(420)(421)(424)(440)(445)(458)(556)
Item 425	Precast Prestressed Concrete Structural Members (420)(421)(424)(426)(427)(434)(440)(442)
Item 432	Riprap (420)(421)(427)(440)
Item 434	Elastomeric Bridge Bearings (420)
Item 442	Metal for Structures (441)((447)(448)
Item 450	Railing (420)(421)(424)(440)(441)(442)
Item 454	Bridge expansion joints (442)
Item 462	Concrete Box Culverts and Storm Drains (400)(420)(421)(424)(464)
Item 464	Reinforced Concrete Pipe (400)(476)
Item 465	Manholes and Inlets (400)(420)(421)(440)(471)
Item 467	Safety End Treatment (400)(420)(421)(440)(432)(445)(464)
Item 471	Frames, Grates, Rings, and Covers (445)(441)(448)
Item 476	Jacking, Boring, or Tunneling Pipe or Box (464)
Item 496	Removing Structures (430)
Item 500	Mobilization
Item 502	Barricades, Signs and Traffic Handling
Item 512	Portable Concrete Traffic Barrier (420)(421)(424)(440)(442)
Item 514	Permanent Concrete Traffic Barrier (400)(416)(420)(421)(424)(440)(442)(448)
Item 529	Concrete Curb, Gutter and Combined Curb and Gutter (360)(420)(421)(440)
Item 545	Crash Cushion Attenuators (421)
Item 610	Roadway Illumination Assemblies (421)(441)(442)(445)(446)(449)(616)(620)

Item 618	Conduit (400)(445)(476)(622)
Item 620	Electrical Conductors
Item 624	Ground Box (421)(440)
Item 628	Electrical Services (441)(445)(449)(618)(620)(627)(656)
Item 636	Aluminum Signs (643)
Item 644	Small Roadside Sign Supports and Assemblies (421)(440)(441)(442)(445)(634)(636)(643)(656)
Item 647	Large Roadside Sign Supports and Assemblies (421)(440)(441)(442)(445)(643)
Item 658	Delineator and Object Markers Assemblies (445)
Item 662	Work Zone Pavement Markings (666)(668)(672)(677)
Item 666	Reflectorized Pavement Markings (316)(318)(662)(677)(678)
Item 672	Raised Pavement Markers (677)(678)
Item 678	Pavement Surface Preparation for Markings (677)

Special Provisions

Special Provisions will govern and take precedence over the Specifications enumerated hereon wherever in conflict therewith. All special provisions are included herein.

Special Provision “General” – FBCTRA

Special Provision “Important Notice to Contractors” (000-100)

Special Provision to Item	1	001-015
Special Provision to Item	3	Award and Execution of Contract (FBCTRA)
Special Provision to Item	4	Scope of Work (FBCTRA)
Special Provision to Item	6	006-030
Special Provision to Item	7	Legal Relations and responsibilities (FBCTRA)
Special Provision to Item	8	Prosecution and Progress (FBCTRA)
Special Provision to Item	9	Measurement and Payment (FBCTRA)
Special Provision to Item	100	100-002

Special Provision to Item	132	132-005, 132-011
Special Provision to Item	164	164-004
Special Provision to Item	166	166-001
Special Provision to Item	260	260-003
Special Provision to Item	360	360-013
Special Provision to Item	368	368-001
Special Provision to Item	420	420-002
Special Provision to Item	425	425-001
Special Provision to Item	434	434-003
Special Provision to Item	442	442-016
Special Provision to Item	450	450-001
Special Provision to Item	454	454-003
Special Provision to Item	462	462-015
Special Provision to Item	464	464-006
Special Provision to Item	465	465-002
Special Provision to Item	476	476-003
Special Provision to Item	500	500-011
Special Provision to Item	502	502-033
Special Provision to Item	512	512-002
Special Provision to Item	514	514-002
Special Provision to Item	610	610-015
Special Provision to Item	620	620-001
Special Provision to Item	624	624-014
Special Provision to Item	628	628-003
Special Provision to Item	636	636-014
Special Provision to Item	672	672-034
Special Provision to Item	1122	1122-001

Special Provision to Item 6834 6834-002

Special Specifications

All Special Specifications are included herein.

Item 1122 Temporary Erosion, Sedimentation, and Environmental Controls

Item 1310 CPM Schedules (FBCTRA)

Item 3061 Fast Track Concrete Pavement

Item 3268 Dense-Graded Hot-Mix Asphalt

Item 6055 In-Lane or Transverse Rumble Strip

Item 6834 Portable Changeable Message Sign

Item 6986 Longitudinal Prefabricated Pavement Markings (PPM) With Warranty (677)(8094)

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 contract.

**FORT BEND COUNTY TOLL ROAD AUTHORITY
SPECIAL PROVISION – GENERAL**

For this project, the following sections of the Texas Standard Specifications (“TSS”) are hereby modified with respect to the clauses cited below and no other clauses or requirements of the TSS are waived or changed hereby.

Global – All references to “State” or “Department” are replaced with “Authority.”

FORT BEND COUNTY TOLL ROAD AUTHORITY

SPECIAL PROVISION

000--- 100

Important Notice to Contractors

The Contractor's attention is directed to the fact that utility adjustments for the construction of this project have, as of October 24, 2014, been adjusted except as listed herein.

All private utilities are to be adjusted by their respective owners to clear construction proposed by this project. Should the Contractor encounter any other utilities such as sewers, water lines, gas lines, etc., he shall contact the respective utility companies or pertinent government agency as soon as it becomes apparent that the utility lines interface with the work.

The Contractor is invited to review the outstanding utility adjustments with the Engineer assigned to this project and listed in the "Important Notice to Contractors".

The following utilities are to be adjusted by their owners and are expected to be completed by the dates shown and are provided her for incorporation by the Contractor into his construction sequencing. At the pre-construction conference, the Authority will provide the successful Contractor with all available information and approximate adjustment dates to be incorporated into the Contractor's construction schedule.

Approximate CL Fort Bend Toll Road	Description	Owner	Expected Completion
818+35	Overhead Power Lines	CenterPoint Energy	June 1, 2015
819+57	Overhead Power Lines	CenterPoint Energy	June 1, 2015
819+67	Gasline	CenterPoint Energy	April 1, 2015
820+82	16" Waterline	City of Missouri	April 1, 2015
826+50	Overhead Power Lines	CenterPoint Energy	June 1, 2015
829+30	Gasline	CenterPoint Energy	June 1, 2015
829+99	16" Waterline	City of Missouri	June 1, 2015
829+13	6" Wastewater Line	City of Missouri	June 1, 2015

SPECIAL PROVISION

001---015

Definition of Terms

For this project, Item 001, "Definition of Terms," 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.

The following Articles are voided and replaced by the following:

1.50. Disadvantaged Business Enterprise (DBE). A small business certified through the Texas Unified Certification Program in accordance with 49 CFR Part 26, that is at least 51% owned by one or more socially and economically disadvantaged individuals, or in the case of a publicly owned business, in which is at least 51% of the stock is owned by one or more socially and economically disadvantaged individuals, and whose management and daily business operations are controlled by one or more of the individuals who own it.

1.128. Subcontractor. A Subcontractor is defined as an individual, partnership, limited liability company, corporation, or any combination thereof that the Contractor sublets, or proposes to sublet, any portion of a Contract, excluding a material supplier, a hauling firm hauling only from a commercial source to the project, truck owner-operator, wholly owned subsidiary, or specialty-type businesses such as security companies and rental companies.

The following Articles are voided and not replaced.

1.97. Proposal.

1.98. Proposal Form.

1.99. Proposal Guaranty.

This Item is supplemented by the following:

1.148. Additive Alternate. A bid item contained in a proposal that is not a regular item or a designated alternate bid item. The additive alternate item(s) include work that may be added to the base bid work.

1.149. Base Bid. The total bid (includes regular bid items or corresponding alternate bid items if lower) amount without additive alternates.

1.150. Affiliates. Two or more firms are affiliated if:

- they share common officers, directors, or stockholders;

- a family member of an officer, director, or stockholder of one firm serves in a similar capacity in another of the firms;
- an individual who has an interest in, or controls a part of, one firm either directly or indirectly also has an interest in, or controls a part of, another of the firms;
- the firms are so closely connected or associated that one of the firms, either directly or indirectly, controls or has the power to control another firm;
- one firm controls or has the power to control another of the firms; or,
- the firms are closely allied through an established course of dealings, including but not limited to the lending of financial assistance.

1.151. Bid. The offer of the bidder for performing the work described in the plans and specifications including any changes made by addenda.

1.152. Bid Guaranty. The security furnished by the bidder as a guaranty that the bidder will enter into a contract if awarded.

1.153. Electronic Bid Form. The bid form contained in the Department's Electronic Bidding System.

1.154. Electronic Bidding System (EBS). The Department's automated system that allows bidders to enter and submit their bid information electronically.

1.155. Electronic Vault. The secure location where electronic bids are stored prior to bid opening.

1.156. Family Member. A family member of an individual is the individual's parent, parent's spouse, step-parent, step-parent's spouse, sibling, sibling's spouse, spouse, child, child's spouse, spouse's child, spouse's child's spouse, grandchild, grandparent, uncle, uncle's spouse, aunt, aunt's spouse, first cousin, or first cousin's spouse.

1.157. Printed Bid Form. The bidding form printed and sent to the bidder by the department or printed by the bidder from the department's Electronic Bidding System.

1.158. Bid Form. The form provided by the Department used by the bidder to submit a bid. The bid form is a Department mailed bidder's form (traditional proposal submitted manually), a Department EBS printed bid form (submitted manually), or the bid form submitted electronically through the Department's EBS.

**FORT BEND COUNTY TOLL ROAD AUTHORITY
SPECIAL PROVISION TO ITEM 3**

For this project, the following sections of the Texas Standard Specifications (“TSS”) are hereby modified with respect to the clauses cited below and no other clauses or requirements of the TSS are waived or changed hereby.

Article 3.1. Award of the Contract. The first paragraph is voided and replaced by the following:

The Authority will award, reject, or defer the Contract within 75 days after the opening of the proposal. The Authority reserves the right to reject any or all proposals and to waive technicalities in the best interest of the County.

Article 3.4.B. Bonds. Is supplemented by the following:

Contractor that is awarded the contract shall complete and sign the following Performance Bond form and Payment Bond form:

Bond No's
Zurich 09096597
Pacific 8237-93-73
Liberty 58S207169

PERFORMANCE BOND

STATE OF TEXAS

Contract Date _____

COUNTY OF Fort Bend

Date Bond Executed _____

PRINCIPAL Williams Brothers Construction Co., Inc.

SURETY Zurich American Insurance Company and Pacific Indemnity Company and Liberty Mutual Insurance Company

OWNER Fort Bend County Toll Road Authority

PENAL SUM OF BOND (in words and figures) Thirty Million Three Hundred Fifty Three Thousand

One Hundred Thirty Two Dollars and 89/100 (\$30,353,132.89)

being 100 percent of the Contract Price.

Fort Bend Parkway Toll Road SH 6 Crossing from 0.59 Miles North of SH 6 to 0.38 Miles South of SH 6

CONTRACT for _____ for Fort Bend County Toll Road Authority, Fort Bend County, Texas.

KNOW ALL PERSONS BY THESE PRESENTS, that we, Principal and Surety above named, are held and firmly bound unto Owner, its successors and assigns, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, officers, directors, shareholders, partners, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal entered into that certain Contract with Owner, dated the same date as this bond, which Contract is expressly incorporated herein for all purposes.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION IS SUCH, that if Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of the Contract during the original term of the Contract and any extensions thereof that may be granted by Owner, with or without notice to Surety, and during the life of any guaranty or warranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of the Contract that may hereafter be made, notice of which modifications to Surety being hereby waived, then this obligation to be void; otherwise to remain in full force and effect.

Should the Principal fail to faithfully and strictly perform the Contract in all its terms, including but not limited to the indemnifications thereunder, the Surety shall be liable for all damages, losses, expenses and liabilities that the Owner may suffer in consequence thereof. Surety understands and agrees that the provision in the Contract that Owner will retain certain amounts due Principal until the expiration of thirty days from the acceptance of the Work is intended for the Owner's benefit, and Owner has the right to pay or withhold such retained amounts or any other amount owing under the Contract to secure completion of the Work without changing or affecting the liability of the Surety hereon to any degree. The Surety further understands and agrees that the provision in the Contract that Owner may itself cause completion of the Work subsequent to an event of default is for Owner's benefit, and such provision shall not change or affect the liability of Surety hereon to any degree.

This bond is given in compliance with the provisions of Chapter 2253 of the Texas Government Code, as amended, which is incorporated herein by this reference. However, all of the express provisions contained herein are applicable whether or not within the scope of said statute.

The bound parties have executed this instrument pursuant to authority of their respective governing body, to be effective on the same date of the Contract.

Williams Brothers Construction Co., Inc.
PRINCIPAL
By [Signature]
Name ROBERT C. LANHAM, JR.
Title PRESIDENT
Address 3800 Milam
Houston, Texas 77006

ATTEST
By [Signature]
Name SETH SCHULGEN
Title SECRETARY

Zurich American Insurance Company
SURETY

(SEAL)
By: [Signature]
Name: Larry H. Senkel
Title: Attorney-In-Fact

Pacific Indemnity Company
By: [Signature]
Larry H. Senkel, Attorney-In-Fact

Physical Address:
Zurich-2000 W. Sam Houston Parkway S., Suite 900, Houston, TX 77042
Pacific-2800 Post Oak Blvd., Suite 2400, Houston, TX 77056
Liberty-13201 Northwest Freeway, Suite 810, Houston, TX 77040

Liberty Mutual Insurance Company
By: [Signature]
Larry H. Senkel, Attorney-In-Fact

Mailing Address
Zurich-2000 W. Sam Houston Parkway S., Suite 900, Houston, TX 77042
Pacific-2800 Post Oak Blvd., Suite 2400, Houston, TX 77056
Liberty-13201 Northwest Freeway, Suite 810, Houston, TX 77040
Telephone 713-787-5952 and 713-297-4647 and 713-744-1762

ATTEST: By: [Signature]
Name: Jo Ann Parker
Title: Witness

LOCAL RECORDING AGENT
PERSONAL IDENTIFICATION
NUMBER:
1238909

The name and address of the Resident Agent of Surety is:
Willis of Texas, Inc., Jo Ann Parker, 920 Memorial City Way, Suite 500, Houston, TX 77024

Surety must attach its original power of attorney to this BOND.

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, SETH SCHULGEN, certify that I am the secretary of the corporation named as Principal in the Bond; that ROBERT C. LANHAM, JR., who signed the bond on behalf of Principal, was then PRESIDENT of the corporation; that I know his or her signature, and his or her signature is genuine; and that the Bond was duly signed for and on behalf of the corporation by authority of its governing body.

[Signature] (Corporate Seal)

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **GEOFFREY DELISIO, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Larry H. SENKEL, Jacqueline KIRK, Judy M. DOLD, Cynthia A. PETERS and Jo Ann PARKER**, all of **Houston, Texas**, EACH its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings, EXCEPT bonds on behalf of Independent Executors, Community Survivors and Community Guardians.** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND, this 26th day of March, A.D. 2013.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



Gregory E. Murray

By _____

*Assistant Secretary
Gregory E. Murray*

Geoffrey Delisio

*Vice President
Geoffrey Delisio*

State of Maryland
City of Baltimore

On this 26th day of March, A.D. 2013, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **GEOFFREY DELISIO, Vice President, and GREGORY E. MURRAY, Assistant Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Constance A. Dunn



Constance A. Dunn, Notary Public
My Commission Expires: July 14, 2015

EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify or revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this ____ day of _____, 20 14 .



A handwritten signature in cursive script that reads "Thomas O. McClellan".

Thomas O. McClellan, Vice President



**Chubb
Surety**

**POWER
OF
ATTORNEY**

**Federal Insurance Company
Vigilant Insurance Company
Pacific Indemnity Company**

**Attn: Surety Department
15 Mountain View Road
Warren, NJ 07059**

Know All by These Presents, That FEDERAL INSURANCE COMPANY, an Indiana corporation, VIGILANT INSURANCE COMPANY, a New York corporation, and PACIFIC INDEMNITY COMPANY, a Wisconsin corporation, do each hereby constitute and appoint David Alan Castillo, Judy M. Dold, Mary Ann Garcia, Mark H. Hilliard, Jo Ann Parker, Cynthia A. Peters and Larry H. Senkel of Houston, Texas

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations. In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this **15th** day of **September, 2014**.

Dawn M. Chloros

Dawn M. Chloros, Assistant Secretary

David B. Norris, Jr.

David B. Norris, Jr., Vice President



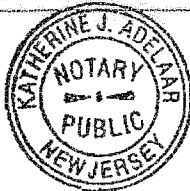
STATE OF NEW JERSEY

ss.

County of Somerset

On this **15th** day of **September, 2014** before me, a Notary Public of New Jersey, personally came Dawn M. Chloros, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Dawn M. Chloros, being by me duly sworn, did depose and say that she is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that she signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that she is acquainted with David B. Norris, Jr., and knows him to be Vice President of said Companies; and that the signature of David B. Norris, Jr., subscribed to said Power of Attorney is in the genuine handwriting of David B. Norris, Jr., and was thereto subscribed by authority of said By-Laws and in deponent's presence.

Notarial Seal



**KATHERINE J. ADELAAR
NOTARY PUBLIC OF NEW JERSEY
No. 2316685
Commission Expires July 16, 2019**

Katherine J. Adelaar
Notary Public

CERTIFICATION

Extract from the By-Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Dawn M. Chloros, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

- (i) the foregoing extract of the By-Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in the U.S. Virgin Islands, and Federal is licensed in American Samoa, Guam, Puerto Rico, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this

, 2014



Dawn M. Chloros

Dawn M. Chloros, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903-3493 Fax (908) 903-3656 e-mail: surety@chubb.com

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 6475756

American Fire and Casualty Company
The Ohio Casualty Insurance Company

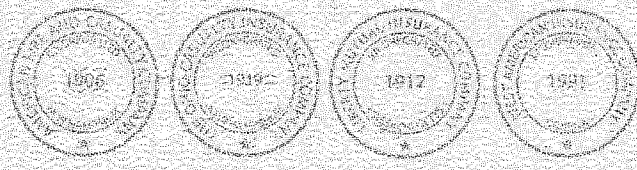
Liberty Mutual Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American Fire & Casualty Company and The Ohio Casualty Insurance Company are corporations duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Cynthia A. Peters; David A. Castillo; Jo Ann Parker; Judy M. Dold; Larry H. Senkel; Mark H. Hilliard; Mary Ann Garcia

all of the city of Houston, state of TX each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 4th day of March, 2014.



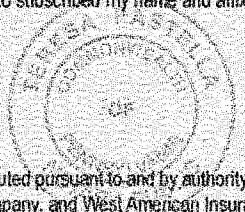
American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 4th day of March, 2014, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American Fire and Casualty Company, Liberty Mutual Insurance Company, The Ohio Casualty Insurance Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Plymouth Mt., Montgomery County, PA
My Commission Expires March 28, 2017
Member: Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS - Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

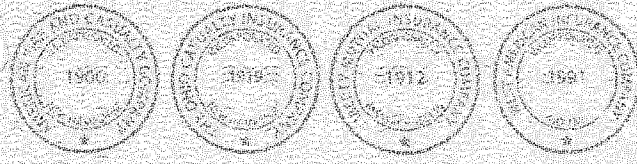
ARTICLE XIII - Execution of Contracts - SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Gregory W. Davenport, the undersigned, Assistant Secretary, of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this _____ day of _____, 2014



By: Gregory W. Davenport
Gregory W. Davenport, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or other financial value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



Fidelity and Deposit Company of Maryland

Home Office: P.O. Box 1227, Baltimore, MD 21203-1227

IMPORTANT NOTICE

To obtain information or make a complaint:

You may call the Fidelity and Deposit Company of Maryland or Colonial American Casualty and Surety Company's or Zurich American Insurance Company toll-free telephone number for information or to make a complaint at:

1-800-654-5155

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights, or complaints at:

1-800-252-3439

You may write the Texas Department of Insurance:

**P.O. Box 149104
Austin, TX 78714-9104
FAX # (512) 475-1771**

PREMIUM OR CLAIM DISPUTES: Should you have a dispute concerning the premium or about a claim, you should first contact Fidelity and Deposit Company of Maryland or Colonial American Casualty and Surety Company. If the dispute is not resolved, you may contact the Texas Department of Insurance.

ATTACH THIS NOTICE TO YOUR POLICY: This notice is for information only and does not become a part or condition of the attached document.

Policyholder Information Notice

IMPORTANT NOTICE

To obtain information or make a complaint:

You may call Chubb's toll-free telephone number for information or to make a complaint at

1-800-36-CHUBB

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights or complaints at

1-800-252-3439

You may write the Texas Department of Insurance

P.O. Box 149104
Austin, TX 78714-9104
FAX # (512) 475-1771
Web: <http://www.tdi.state.tx.us>
E-mail: ConsumerProtection@tdi.state.tx.us

PREMIUM OR CLAIM DISPUTES:

Should you have a dispute concerning your premium or about a claim you should contact the agent first. If the dispute is not resolved, you may contact the Texas Department of Insurance.

ATTACH THIS NOTICE TO YOUR POLICY:

This notice is for information only and does not become a part or condition of the attached document.

AVISO IMPORTANTE

Para obtener información o para someter una queja:

Usted puede llamar al número de teléfono gratis de Chubb's para información o para someter una queja al

1-800-36-CHUBB

Puede comunicarse con el Departamento de Seguros de Texas para obtener información acerca de compañías, coberturas, derechos o quejas al

1-800-252-3439

Puede escribir al Departamento de Seguros de Texas

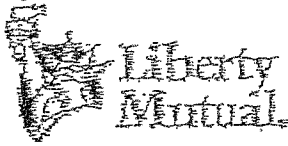
P.O. Box 149104
Austin, TX 78714-9104
FAX # (512) 475-1771
Web: <http://www.tdi.state.tx.us>
E-mail: ConsumerProtection@tdi.state.tx.us

DISPUTAS SOBRE PRIMAS O RECLAMOS:

Si tiene una disputa concerniente a su prima o a un reclamo, debe comunicarse con el agente primero. Si no se resuelve la disputa, puede entonces comunicarse con el departamento (TDI).

UNA ESTE AVISO A SU POLIZA:

Este aviso es solo para propósito de información y no se convierte en parte o condición del documento adjunto.



Important Notice

TO OBTAIN INFORMATION OR TO MAKE A COMPLAINT:

You may write to Liberty Mutual Surety at:

Liberty Mutual Surety
Interchange Corporate Center
450 Plymouth Road, Suite 400
Plymouth Meeting, PA 19462-8284

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights or complaints at:

1-800-252-3439

You may write the Texas Department of Insurance:

P. O. Box 149104
Austin, TX 78714-9104
Fax: (512) 475-1771
Web: <http://www.tdi.state.tx.us>
E-mail: ConsumerProtection@tdi.state.tx.us

Premium or Claim Disputes

Should you have a dispute concerning a premium, you should contact the agent first. If you have a dispute concerning a claim, you should contact the company first. If the dispute is not resolved, you may contact the Texas Department of Insurance.

Attach This Notice To Your Policy:

This notice is for information only and does not become a part or condition of the attached document.

Bond No's
Zurich 09096597
Pacific 8237-93-37
Liberty 58S207169

PAYMENT BOND

STATE OF TEXAS Contract Date _____

COUNTY OF Fort Bend Date Bond Executed _____

PRINCIPAL Williams Brothers Construction Co., Inc.

SURETY Zurich American Insurance Company and Pacific Indemnity Company and Liberty Mutual Insurance Company

OWNER Fort Bend County Toll Road Authority

PENAL SUM OF BOND (in words and figures) Thirty Million Three Hundred Fifty Three Thousand

One Hundred Thirty Two Dollars and 89/100 (\$30,353,132.89)

being 100 percent of the Contract Price.

CONTRACT for Fort Bend Parkway Toll Road SH 6 Crossing from 0.59 Miles North of SH 6 to 0.38 Miles South of SH 6
Bend County Toll Road Authority, Fort Bend County, Texas. for Fort

KNOW ALL PERSONS BY THESE PRESENTS, that we, Principal and Surety above named, are held and firmly bound unto Owner, its successors and assigns, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves and our respective heirs, executors, administrators, officers, directors, shareholders, partners, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal entered into the Contract with Owner, dated the same date as this bond, which Contract is incorporated herein for all purposes.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION IS SUCH, that if Principal shall promptly pay claimants for all labor, subcontracts, materials and specially fabricated materials performed or furnished under or by virtue of the Contract, and duly authorized modifications and normal and usual extras thereto, notice of which modifications to Surety being hereby waived, then this obligation shall be void, otherwise to remain in full force and effect. Should Principal fail to promptly pay claimants for all labor, subcontracts, materials and specially fabricated materials performed or furnished under or by virtue of the Contract, Surety is hereby bound to make such payments on behalf of Principal up to a total aggregate amount equal to the penal sum of the bond. Labor, subcontracts, materials, and specially fabricated materials shall be construed in accordance with Chapter 2253, Texas Government Code.

PROVIDED, HOWEVER, that Owner having required Principal to furnish this Bond in order to comply with the provisions of Chapter 2253, Texas Government Code, all rights and remedies on this Bond shall inure solely to such claimants and shall be determined in accordance with the provisions, conditions, and limitations of the aforesaid Government Code to the same extent as if they were copied at length herein.

The bound parties have executed this instrument pursuant to authority of their respective governing body, to be effective on the same date of the Contract.

Williams Brothers Construction Co., Inc.
PRINCIPAL
By: [Signature]
Name: ROBERT C. LANHAM, JR.
Title: PRESIDENT
Address: 3800 Milam
Houston, TX 77006

ATTEST
By: [Signature]
Name: SETH SCHULGEN
Title: SECRETARY

(SEAL)

Zurich American Insurance Company
SURETY

By: [Signature]
Name: Larry H. Senkel
Title: Attorney-In-Fact

Pacific Indemnity Company
By: [Signature]
Larry H. Senkel, Attorney-In-Fact

Physical Address:
Zurich-2000 W. Sam Houston Parkway S., Suite 900, Houston, TX 77042
Pacific-2800 Post Oak Blvd., Suite 2400, Houston, TX 77056
Liberty-13201 Northwest Freeway, Suite 810, Houston, TX 77040

Liberty Mutual Insurance Company
By: [Signature]
Larry H. Senkel, Attorney-In-Fact

Mailing Address
Zurich-2000 W. Sam Houston Parkway S., Suite 900, Houston, TX 77042
Pacific-2800 Post Oak Blvd., Suite 2400, Houston, TX 77056
Liberty-13201 Northwest Freeway, Suite 810, Houston, TX 77040
Telephone 713-787-5952 and 713-297-4647 and 713-744-1762

ATTEST: By: [Signature]
Name: Jo Ann Parker
Title: Witness

LOCAL RECORDING AGENT
PERSONAL IDENTIFICATION
NUMBER:
1238909

The name and address of the Resident Agent of Surety is:
Willis of Texas, Inc., Jo Ann Parker, 920 Memorial City Way, Suite 500, Houston, TX 77024

Surety must attach its original power of attorney to this BOND.

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, SETH SCHULGEN, certify that I am the secretary of the corporation named as Principal in the Bond; that ROBERT C. LANHAM, JR., who signed the bond on behalf of Principal, was then PRESIDENT of the corporation; that I know his or her signature, and his or her signature is genuine; and that the Bond was duly signed for and on behalf of the corporation by authority of its governing body.

[Signature] (Corporate Seal)

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **GEOFFREY DELISIO, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Larry H. SENKEL, Jacqueline KIRK, Judy M. DOLD, Cynthia A. PETERS and Jo Ann PARKER, all of Houston, Texas, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings, EXCEPT bonds on behalf of Independent Executors, Community Survivors and Community Guardians.** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND, this 26th day of March, A.D. 2013.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



Gregory E. Murray

By: _____

*Assistant Secretary
Gregory E. Murray*

Geoffrey Delisio

*Vice President
Geoffrey Delisio*

State of Maryland
City of Baltimore

On this 26th day of March, A.D. 2013, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **GEOFFREY DELISIO, Vice President, and GREGORY E. MURRAY, Assistant Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Constance A. Dunn



Constance A. Dunn, Notary Public
My Commission Expires: July 14, 2015

EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify or revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this ____ day of _____, 20 14.



A handwritten signature in cursive script, reading "Thomas O. McClellan".

Thomas O. McClellan, Vice President



**Chubb
Surety**

**POWER
OF
ATTORNEY**

**Federal Insurance Company
Vigilant Insurance Company
Pacific Indemnity Company**

**Attn: Surety Department
15 Mountain View Road
Warren, NJ 07059**

Know All by These Presents, That **FEDERAL INSURANCE COMPANY**, an Indiana corporation, **VIGILANT INSURANCE COMPANY**, a New York corporation, and **PACIFIC INDEMNITY COMPANY**, a Wisconsin corporation, do each hereby constitute and appoint **David Alan Castillo, Judy M. Dold, Mary Ann Garcia, Mark H. Hilliard, Jo Ann Parker, Cynthia A. Peters and Larry H. Senkel of Houston, Texas**

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY** have each executed and attested these presents and affixed their corporate seals on this **15th** day of **September, 2014**.

Dawn M. Chloros

Dawn M. Chloros, Assistant Secretary

David B. Norris, Jr.

David B. Norris, Jr., Vice President



STATE OF NEW JERSEY

ss.

County of Somerset

On this **15th** day of **September, 2014** before me, a Notary Public of New Jersey, personally came Dawn M. Chloros, to me known to be Assistant Secretary of **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY**, the companies which executed the foregoing Power of Attorney, and the said Dawn M. Chloros, being by me duly sworn, did depose and say that she is Assistant Secretary of **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY** and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that she signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that she is acquainted with David B. Norris, Jr., and knows him to be Vice President of said Companies; and that the signature of David B. Norris, Jr., subscribed to said Power of Attorney is in the genuine handwriting of David B. Norris, Jr., and was thereto subscribed by authority of said By-Laws and in deponent's presence.

Notarial Seal



**KATHERINE J. ADELAAR
NOTARY PUBLIC OF NEW JERSEY
No. 2316685
Commission Expires July 16, 2019**

Katherine J. Adelaar
Notary Public

CERTIFICATION

Extract from the By-Laws of **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY**:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Dawn M. Chloros, Assistant Secretary of **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY** (the "Companies") do hereby certify that

- (i) the foregoing extract of the By-Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in the U.S. Virgin Islands, and Federal is licensed in American Samoa, Guam, Puerto Rico, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this

, 2014



Dawn M. Chloros

Dawn M. Chloros, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903-3493 Fax (908) 903-3656 e-mail: surety@chubb.com

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 6214032

American Fire and Casualty Company
The Ohio Casualty Insurance Company

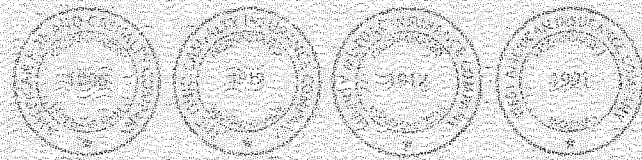
Liberty Mutual Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American Fire & Casualty Company and The Ohio Casualty Insurance Company are corporations duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Cindy Peters; Jacqueline Kirk; Jo Ann Parker; Judy M. Doid; Larry H. Senkel; Mark Hilliard

all of the city of Houston state of TX each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 19th day of July 2013



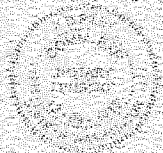
American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: Gregory W. Davenport
Gregory W. Davenport, Assistant Secretary

STATE OF WASHINGTON ss
COUNTY OF KING

On this 19th day of July 2013, before me personally appeared Gregory W. Davenport, who acknowledged himself to be the Assistant Secretary of American Fire and Casualty Company, Liberty Mutual Insurance Company, The Ohio Casualty Insurance Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Seattle, Washington, on the day and year first above written.



By: KD Riley
KD Riley, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS - Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

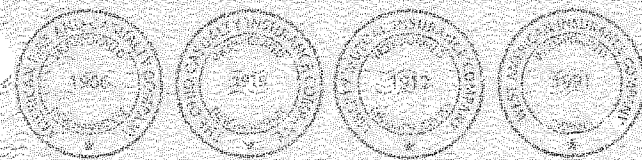
ARTICLE XIII - Execution of Contracts - SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes Gregory W. Davenport, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, David M. Carey, the undersigned, Assistant Secretary, of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 19th day of July, 2014



By: David M. Carey
David M. Carey, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or other financial value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day



Fidelity and Deposit Company of Maryland

Home Office: P.O. Box 1227, Baltimore, MD 21203-1227

IMPORTANT NOTICE

To obtain information or make a complaint:

You may call the Fidelity and Deposit Company of Maryland or Colonial American Casualty and Surety Company's or Zurich American Insurance Company toll-free telephone number for information or to make a complaint at:

1-800-654-5155

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights, or complaints at:

1-800-252-3439

You may write the Texas Department of Insurance:

**P.O. Box 149104
Austin, TX 78714-9104
FAX # (512) 475-1771**

PREMIUM OR CLAIM DISPUTES: Should you have a dispute concerning the premium or about a claim, you should first contact Fidelity and Deposit Company of Maryland or Colonial American Casualty and Surety Company. If the dispute is not resolved, you may contact the Texas Department of Insurance.

ATTACH THIS NOTICE TO YOUR POLICY: This notice is for information only and does not become a part or condition of the attached document.

Policyholder Information Notice

IMPORTANT NOTICE

To obtain information or make a complaint:

You may call Chubb's toll-free telephone number for information or to make a complaint at

1-800-36-CHUBB

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights or complaints at

1-800-252-3439

You may write the Texas Department of Insurance

P.O. Box 149104
Austin, TX 78714-9104
FAX # (512) 475-1771
Web: <http://www.tdi.state.tx.us>
E-mail: ConsumerProtection@tdi.state.tx.us

PREMIUM OR CLAIM DISPUTES:

Should you have a dispute concerning your premium or about a claim you should contact the agent first. If the dispute is not resolved, you may contact the Texas Department of Insurance.

ATTACH THIS NOTICE TO YOUR POLICY:

This notice is for information only and does not become a part or condition of the attached document.

AVISO IMPORTANTE

Para obtener información o para someter una queja:

Usted puede llamar al número de teléfono gratis de Chubb's para información o para someter una queja al

1-800-36-CHUBB

Puede comunicarse con el Departamento de Seguros de Texas para obtener información acerca de compañías, coberturas, derechos o quejas al

1-800-252-3439

Puede escribir al Departamento de Seguros de Texas

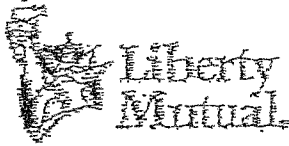
P.O. Box 149104
Austin, TX 78714-9104
FAX # (512) 475-1771
Web: <http://www.tdi.state.tx.us>
E-mail: ConsumerProtection@tdi.state.tx.us

DISPUTAS SOBRE PRIMAS O RECLAMOS:

Si tiene una disputa concerniente a su prima o a un reclamo, debe comunicarse con el agente primero. Si no se resuelve la disputa, puede entonces comunicarse con el departamento (TDI).

UNA ESTE AVISO A SU POLIZA:

Este aviso es solo para propósito de información y no se convierte en parte o condición del documento adjunto.



Important Notice

TO OBTAIN INFORMATION OR TO MAKE A COMPLAINT:

You may write to Liberty Mutual Surety at:

Liberty Mutual Surety
Interchange Corporate Center
450 Plymouth Road, Suite 400
Plymouth Meeting, PA 19462-8284

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights or complaints at:

1-800-252-3439

You may write the Texas Department of Insurance:

P. O. Box 149104
Austin, TX 78714-9104
Fax (512) 475-1771
Web: <http://www.tdi.state.tx.us>
E-mail: ConsumerProtection@tdi.state.tx.us

Premium or Claim Disputes

Should you have a dispute concerning a premium, you should contact the agent first. If you have a dispute concerning a claim, you should contact the company first. If the dispute is not resolved, you may contact the Texas Department of Insurance.

Attach This Notice To Your Policy:

This notice is for information only and does not become a part or condition of the attached document.

**FORT BEND COUNTY TOLL ROAD AUTHORITY
SPECIAL PROVISION TO ITEM 4**

For this project, the following sections of the Texas Standard Specifications (“TSS”) are hereby modified with respect to the clauses cited below and no other clauses or requirements of the TSS are waived or changed hereby.

Article 4.2. Changes in the Work. The first paragraph is supplemented by the following:

The Contractor is responsible for notifying the sureties of any changes to the contract.

Article 4.2. Changes in the Work. The sixth paragraph is voided and replaced by the following:

When the quantity of work to be done under any major item of the Contract is less than 75% of the original quantity stated in the Contract, then either party to the Contract may request an adjustment to the unit price. When mutually agreed, the unit price may be adjusted by multiplying the Contract unit price by the factor in Table 1. If an adjusted unit price cannot be agreed upon, the Engineer may determine the unit price by multiplying the Contract unit price by the factor in Table 1.

**Table 1
Quantity-Based Price Adjustment Factors**

% of Original Quantity	Factor
≥ 50 and < 75	1.05
≥ 25 and < 50	1.15
< 25	1.25

Article 4.2. Changes in the Work is supplemented by the addition of the following:

For purposes of extra work, the following individuals have the authority shown to approve extra work. The Authority has no obligation to pay for extra work unless the Contractor secures written authorization executed by the appropriate person prior to commencement of the work. Extra work may not be split or severed to avoid the requirements of this section.

Mike Stone (Operations Manager) or Bill Jameson (General Manager): \$ 50,000 or less

Board of Directors: greater than \$ 50,000

Article 4.4. Requests and Claims for Additional Compensation The Article is deleted and replaced with the following:

In the event the Contractor requests additional compensation for work not clearly covered in the contract, the contractor shall notify the Authority in writing of his intention to make a claim for additional compensation before beginning such work, within 21 days of the day Contractor knows or should have known of such claim. The Contractor must provide a written estimate of the amount of the claim or assessment of damages within 30 days of timely notice of the claim.

If such notice is not given, then the Contractor waives his right to file a claim for such work. Notice of such claim by the Contractor and the documentation of the cost of the claim work by Contractor shall not be construed as proof or substantiation of the validity of such claim. All such claims must be approved in writing by the Board of Directors of the Authority.

No claims for delay damages may be made nor will the Authority ever be obligated to pay delay damages. Contractor's sole remedy for damages caused by delay is an extension of the contract time. This limitation applies to delay caused by the Authority and delay caused by third parties only. Contractor will not be entitled to extension of time for delays resulting in whole or part from the Contractor's actions or omissions.

Item 4 is supplemented by the addition of the following Article

Article 4.7. Change Orders. The unit prices Bid shall govern for additions to, or deductions from the Contract. If materials or labor are required for which no unit price is bid, the price shall be that reached by agreement by the Authority and the Contractor after definite evidence is furnished by the Contractor to the Authority that the price is the current prevailing price in the area. If the Authority and the Contractor cannot agree, the Engineer shall determine the price for changes.

No compensation shall be allowed under a Change Order for any person not actively engaged in the performance of the specified work.

No extra work shall be paid for without an approved Change Order prior to the start of the extra work.

If additional time is required by reason of the Change, the number of days for completion provided for in this Contract shall be adjusted at the time the Change Order is entered into, and if no adjustment is made on the Change Order form, any additional time is to be considered waived by the Contractor.

Any extension of time given shall not release the Contractor or the Surety from their Performance and Payment Bonds or from all obligations hereunder, which shall remain in full force until the discharge of the Contract.

All time limits stated in the Contract Documents are the essence of the agreement. The provisions of this Article 4.7 shall not exclude recovery of damage (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs for delay by either party.)

SPECIAL PROVISION

006---030

Control of Materials

For this project, Item, Item 006, “Control of Materials,” of the Standard Specifications is amended hereby with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 6.9. Recycled Materials is voided and replaced by the following:

The Department will not allow hazardous wastes, as defined in 30 TAC 335, proposed for recycling. Use nonhazardous recyclable materials (NRMs) only if the Specification for the Item does not disallow or restrict use. Determine if NRMs are regulated under 30 TAC 312, 330, 332, 334, or 335, and comply with all general prohibitions and requirements. Use NRMs in accordance with DMS-11000, “Evaluating and Using Nonhazardous Recyclable Materials Guidelines,” and furnish all documentation required by that Specification.

Article 6.10. Hazardous Materials is voided and replaced by the following:

Use materials that are free of hazardous materials as defined in Item 1, “Definition of Terms.”

Notify the Engineer immediately when a visual observation or odor indicates that materials in required material sources or on sites owned or controlled by the Department may contain hazardous materials. Except in the case of Section 6.10.A.1.a, “Cleaning and Painting Steel” below, the Department is responsible for testing and removing or disposing of hazardous materials not introduced by the Contractor on sites owned or controlled by the Department as indicated below. The plans will indicate locations where paint on steel is suspected to contain hazardous materials and where regulated asbestos containing materials have been found. The Engineer may suspend work wholly or in part during the testing, removal, or disposition of hazardous materials on sites owned or controlled by the Department, except in the case of Section 6.10.A.1.a.

When a visual observation or odor indicates that materials delivered to the work locations by the Contractor may contain hazardous materials, have an approved commercial laboratory test the materials for contamination. Remove, remediate, and dispose of any of these materials found to be contaminated. Testing, removal, and disposition of hazardous materials introduced onto the work locations by the Contractor will be at the Contractor’s expense. Working day charges will not be suspended and extensions of working days will not be granted for activities related to handling hazardous material delivered by the Contractor.

A. Painted Steel Requirements. As shown on the plans, existing paint on steel may contain hazardous materials. Perform work in accordance with the following:

1. Removing Paint from Steel.

- a. **Cleaning and Painting Steel.** For contracts that are primarily for painting existing steel, perform the work in accordance with Item 446, “Cleaning and Painting Steel.”
 - b. **Other Contracts.** For all other projects when an existing paint must be removed to perform other work, perform paint removal work in accordance with Item 446, “Cleaning and Painting Steel” unless the paint is shown or determined to contain hazardous materials. If the paint is shown or determined to contain hazardous materials, the Department will provide for a separate contractor to remove paint prior to or during the Contract to allow dismantling of the steel for the Contractor’s salvaging, reuse, or recycling or where paint must be removed to perform other work. For steel that is dismantled by unbolting, no paint stripping will be required. Use care to not damage existing paint. When dismantling is performed using flame or saw-cutting methods to remove steel elements coated with paint containing hazardous materials, the plans will show stripping locations. Coordinate with the separate contractor for stripping work to be performed during the Contract.
2. **Removal and Disposal of Painted Steel.** For Contracts where painted steel is to be removed and disposed of by the Contractor, painted steel may be reused or disposed of at a steel recycling or smelting facility. If the paint is shown or determined to contain hazardous materials, maintain and make available to the Engineer invoices and other records showing the reuse owner or for recycling, records obtained from the recycling or smelting facility showing the received weight of the steel and the facility name. Painted steel to be retained by the Department will be shown on the plans.
- B. **Asbestos Requirements.** The plans will indicate locations or elements where asbestos containing materials (ACM) have been found. At these locations or at locations where previously unknown ACM has been found, the Department will arrange for abatement by a separate contractor during the Contract. For work at these locations, notify the Engineer of proposed dates of demolition or removal of structural elements with ACM at least 60 days before work is to begin to allow the Department sufficient time to abate the asbestos.

When the work by a separate contractor for removal of paint or asbestos abatement is to be performed during the Contract, provide traffic control as shown on the plans and coordinate and cooperate with the separate contractor. Continue other work detailed in the plans not directly involved in the paint removal or asbestos abatement work. Coordinate with the Department the timing of the separate contractor’s work in advance in order to allow the Department to schedule work with the separate contractor. Work for the traffic control and other work will not be paid for directly but will be subsidiary to pertinent Items.

FORT BEND COUNTY TOLL ROAD AUTHORITY
SPECIAL PROVISION TO ITEM 7
LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

For the Work, Item 7 of the Texas Standard Specifications is hereby modified with respect to the clauses cited below and no other clauses or requirements of this item are waived or changed hereby.

Article 7.1, Laws to be Observed, is supplemented by the addition of the following:

It is the intent of the Authority that all construction work shall be accomplished with minimum disturbance and inconvenience to the public.

The operation of heavy construction equipment over adjacent streets shall be avoided to the greatest extent practicable. If such operation is unavoidable, care shall be taken to prevent the creation of any nuisance, including, but not limited to, the tracking of dirt or the blowing of dust from uncovered loads.

If sites, buildings, and locations of historical, archaeological, educational, or scientific interests are discovered after construction operations are begun, operation in that particular area shall cease immediately and the sites, buildings, or location shall be investigated or evaluated by the Fort Bend County Toll Road Authority (FBCTRA). An extension of time will be granted, if necessary, for delays caused by these investigations and evaluations. It is specifically understood, however, that if the Contractor is delayed by virtue of an investigation and evaluation that this delay will not be considered as basis for claim for damages or additional compensation of any kind by the Contractor and that an extension of time will be sole remedy of Contractor for such delay.

Article 7.4, Insurance and Bonds is voided and replaced by the following:

1. The Contractor shall not commence work until he has furnished the Authority with satisfactory proof of insurance of such character and in such amounts as set forth herein.
 - a. Procurement. Contractor shall procure and maintain in force and effect during the Work the insurance described in the Contract, procure such endorsements as may be necessary to cause Contractor's insurance to comply with the Contract, and shall obtain such other casualty insurance as Contractor may deem necessary for protection of potential liabilities or Contractor's property. If Contractor fails to procure and maintain in force the insurance required, Authority may, but is not required to, procure the same at Contractor's sole expense. In all events, Contractor shall be liable for all loss caused by its failure to comply with these requirements.

Provision of the required insurance coverages and the actual certificates is a condition precedent to the obligations of Authority under the Contract, and if Contractor shall at any time fail to provide the required insurance coverages, such failure shall constitute a material breach of Contractor's obligations under this Contract.

Contractor agrees to procure and to maintain in full force and effect, at Contractor's sole expense, insurance of the types set forth below, underwritten by insurance companies satisfactory to Authority and having an A.M. Best's Rating of not less than "A- VII":

- i. Workers' Compensation and Employers' Liability. Contractor shall carry statutory Workers' Compensation Insurance covering Contractor's employees in compliance with all requirements of the Texas Workers' Compensation Act, as further described in these Special Conditions below. Contractor shall also carry Employer's Liability Insurance in an amount not less than the following:

Each Accident	\$1,000,000
Each Disease Each Employee	\$1,000,000
Disease Policy Limit	\$1,000,000

- ii. General Liability Insurance. Contractor shall carry general liability insurance on a form no less broad than the coverage provided by a "Commercial General Liability Insurance" form promulgated by the Insurance Services Office, and containing language affording coverage for contractual liability, the products and completed operations hazards, broad form property damage liability, and the explosion, collapse and underground hazards, as respects all operations and work hereunder, for all liability arising out of injury to or death of one or more persons, and injury to or destruction of property, in any one occurrence, in amounts not less than:

General Aggregate	\$ 2,000,000
Products Comp/Ops Aggregate	\$ 1,000,000
Personal & Advertising Injury	\$ 1,000,000
Each Occurrence	\$ 1,000,000

- iii. Automobile Liability Insurance. Contractor shall carry Automobile Liability Insurance on a form no less broad than the coverage provided by a Business Automobile Liability Insurance form promulgated by the Insurance Services Office, on all owned or hired autos, as well as non owned autos, in an amount not less than \$1,000,000 combined single limit, for all liability arising out of injury to or death of one or more persons, and injury to or destruction of property, in any one occurrence.

- iv. Excess Liability Insurance. Contractor shall carry Excess Liability Insurance that follows the form of the underlying primary liability insurance required by Sections 1.a.ii and 1.a.iii, in an amount not less than \$2,000,000 per occurrence and \$2,000,000 in the aggregate. Such excess liability insurance shall name Authority and Engineer as additional insureds in accordance with Section 1.b.i, and shall contain language waiving or otherwise relinquishing any "other insurance" limitation or right of contribution by other insurance that may be maintained by Authority or Engineer.

- v. Pollution Liability. Insurance for preparatory work related to potentially contaminated areas, in the amount required by Authority.

b. Required Endorsements.

- i. Additional Insured. To the fullest extent allowed by applicable Laws and Regulations, Contractor shall name the Indemnified Parties as additional insureds to the same extent as Contractor is required to indemnify the Indemnified Parties pursuant to the Contract. Such additional insured coverage shall be to the full extent of the limits of liability on all policies of liability insurance (other than Worker's Compensation and Employers' Liability insurance) maintained in force or procured by Contractor during the Work, and shall cause such insurance to provide, if necessary by endorsement, that each such policy shall respond as primary insurance and shall not contribute with or apply as excess over any other valid and collectible other insurance that may be maintained by Authority or Engineer. In addition, Contractor shall cause the insurance required by Sections 1.a.ii, 1.a.iii, 1.a.iv and 1.a.i to provide or be endorsed to provide that such insurance applies separately to each insured against whom claim is made or suit is brought.
- ii. Waiver of Subrogation. Inasmuch as Authority and Contractor intend that all of Contractor's insured loss and liabilities fall upon Contractor's insurers, without recourse against the Indemnified Parties, Contractor agrees to cause of all its policies of insurance maintained in force or procured by Contractor during the Work to provide, if necessary by endorsement, that each such insurer fully waives subrogation against Authority and Engineer. The insurance as to which subrogation waiver is required includes, but is not limited to, that required by Sections 1.a.i, 1.a.ii, 1.a.iii, 1.a.iv and 1.a.i. Contractor hereby waives and releases all Claims it may have against the Indemnified Parties to the extent any of such Claims are covered by insurance required to be furnished by Contractor or any Subcontractors hereunder, whether or not Contractor actually obtains such insurance, and EVEN IF SUCH CLAIMS ARISE OUT OF, RELATE TO OR ARE BASED UPON THE NEGLIGENCE, BREACH OF CONTRACT, BREACH OR VIOLATION OF A STATUTE, ORDINANCE, GOVERNMENTAL REGULATION, STANDARD, OR RULE, OR OTHER FAULT, HOWEVER CHARACTERIZED, OR STRICT LIABILITY WITHOUT REGARD TO FAULT, OF AN INDEMNIFIED PARTY.
- iii. Notice of Modification/Cancellation. All policies for which any Indemnified Parties are named insureds or additional insureds shall be endorsed to require the insurer to provide such named insured and additional insureds with at least thirty (30) days prior written notice of any reduction in the limit of liability by endorsement of the policy, cancellation, or non-renewal of the insurance coverage required under this Contract. For policies on which an Indemnified Party is neither a named insured nor an additional insured, Contractor shall provide such Indemnified Party with at least thirty (30) days prior written notice of any reduction in the limit of liability by endorsement of the policy, cancellation, or non-renewal of the insurance coverage required under this Contract.

- c. Deductibles. Any and all deductibles, or self-insured retentions, of all insurance policies maintained by Contractor, including insurance required hereunder, shall be assumed by, for the account of, and at the Contractor's sole risk and expense, and shall not be billed to or payable by Authority.
- d. Certificates of and Proof of Insurance. Contractor shall furnish Authority with certificates of insurance showing Contractor's procurement of the insurance required hereunder, in compliance with Applicable Laws and Regulations. Contractor agrees to review each certificate, and hereby warrants to Authority the accuracy of all information shown on each Certificate furnished. In addition, Contractor, upon request, shall promptly:
- i. Permit Authority to inspect the originals of all required insurance at the offices of Contractor or its insurance broker;
 - ii. Provide copies of all required insurance to Authority; and
 - iii. Authorize Authority to communicate directly (by telephone, email, or in person) with Contractor's insurance broker for the purpose of verifying Contractor's compliance with these requirements or to answer questions concerning Contractor's insurance.
- e. Claims-Made Insurance. If the insurance required hereunder is procured on a form affording "claims-made" coverage, then (i) all limits stated above as "per occurrence" shall be understood to mean "per claim" or "per occurrence," as is consistent with the terms of the "claims-made" policy; and, (ii) such claims-made insurance shall not provide for a retroactive date later than the commencement of Contractor's performance hereunder.
- f. Insolvency of Insurer and Reinstatement of Impaired Limits. In the event of the insolvency of any insurer underwriting any insurance required hereunder, Contractor shall replace such insurance with insurance meeting the requirements hereof. In the event that the required aggregate limits of liability of any insurance required hereunder are reduced or impaired by 50% or more, then Contractor shall give Authority prompt notice of the impairment and promptly cause such impaired limits to be reinstated to the required limits.
- g. Subcontractors' Insurance. Contractor shall cause its subcontractors, including all persons hired by Contractor who are not Contractor's employees, who perform any part of the work hereunder, to procure and to maintain in full force and effect insurance of the types and amounts, and meeting the requirements described in Sections 1.a.i, 1.a.ii, 1.a.iii, 1.a.iv and 1.a.v and of 1.b.i and 1.b.ii above. In addition, subcontractors shall comply with Section 1.a.v, if applicable.
- h. Term of Required Insurance. All terms of these insurance requirements shall survive termination of this Contract and shall continue until thirty (30) calendar days after completion of all Work or services to be provided hereunder, including the performance of any warranty work. In addition, Contractor shall maintain in force and effect completed operations coverage under the insurance policies required by paragraphs 1.a.ii

and 1.a.iv, and any “claims-made” coverage within paragraph 1.e, for a minimum of two (2) years after Final Completion of all work or services to be provided hereunder. Contractor shall purchase an extended reporting period, or “tail coverage,” if necessary to comply with the latter requirement.

- i. No Waiver by Authority. Contractor’s failure to provide insurance as required hereunder, or Contractor’s failure to supply certificates of insurance that comply with Section 1.d, above, or the failure of Authority to require evidence of insurance or to notify Contractor of any breach by Contractor of the requirements of these provisions, or deficiencies in the insurance obtained, shall not constitute a waiver by Authority of any of the these insurance requirements, or a waiver of any other terms and conditions of this Contract, including Contractor’s obligations to defend, indemnify, and hold harmless Authority, as required herein.
- j. Minimum Limits. The foregoing insurance requirements are minimum requirements intended to benefit Authority and Engineer, shall not be interpreted to limit Contractor’s liability to Authority in any manner whatsoever; and, are separate from and independent of Contractor’s other obligations under this Contract, including Contractor’s obligations to defend, indemnify and hold harmless Authority.

Article 7.8. Hauling and Loads on Roadways and Structures is supplemented by the following:

D. Stockpiling of Materials. Do not store or stockpile material on bridge structures without written permission. If required, submit a structural analysis and supporting documentation by a licensed professional engineer for review by the Engineer. Permission may be granted if the Engineer finds that no damage or overstresses in excess of those normally allowed for occasional overweight loads will result to structures that will remain in use after Contract completion. Provide temporary matting or other protective measures as directed.

Article 7.12, Responsibility of Damage Claims is voided and replaced by the following:

TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR SHALL PROTECT, DEFEND, INDEMNIFY AND HOLD HARMLESS FORT BEND COUNTY TOLL ROAD AUTHORITY, THE PROJECT ENGINEER, THE SECTION ENGINEER(S), THE CONSTRUCTION PHASE ENGINEER, AND THEIR RESPECTIVE OFFICERS AND EMPLOYEES (COLLECTIVELY, THE “INDEMNIFIED PARTIES”) FROM AND AGAINST EVERY LOSS, ITEM OF DAMAGE, INJURY, EXPENSE, DEMAND, CLAIM, CAUSE OF ACTION, JUDGMENT OR LIABILITY, OF WHATSOEVER KIND OR CHARACTER, WHETHER ARISING IN CONTRACT OR TORT OR UNDER ANY STATUTE, FOR EVERY ELEMENT OF RECOVERY, WHETHER DIRECT OR INDIRECT, INCLUDING SPECIAL AND CONSEQUENTIAL DAMAGES, AND INCLUDING ALL RELATED FINES, FEES AND COSTS, TO INCLUDE ALL FEES AND CHARGES OF ENGINEERS, ARCHITECTS, ATTORNEYS AND OTHER PROFESSIONALS AND ALL COURT OR ARBITRATION OR OTHER DISPUTE RESOLUTION COSTS, FOR:

(I) BODILY INJURY OR DEATH OF AN EMPLOYEE OF ANY CONTRACTOR PARTIES, EVEN IF SUCH BODILY INJURY OR DEATH IS CAUSED IN WHOLE OR

IN PART BY THE NEGLIGENCE, BREACH OF CONTRACT, BREACH OR VIOLATION OF A STATUTE, ORDINANCE, GOVERNMENTAL REGULATION, STANDARD, OR RULE, OR OTHER FAULT OF AN INDEMNIFIED PARTY;AND

(II) BODILY INJURY TO OR DEATH OF ANY PERSON NOT ENCOMPASSED IN (I), ABOVE, PROPERTY DAMAGE OR ECONOMIC LOSS (INCLUDING LOSS OF USE) CAUSED BY OR ARISING OUT OF ANY BREACH OF THIS CONTRACT, OR THE BREACH OF ANY COMMON LAW DUTY, OR THE VIOLATION OF ANY STATUTE OR REGULATION BY THE CONTRACTOR PARTIES IN CONNECTION WITH THE PERFORMANCE (OR NON-PERFORMANCE) OF THE WORK, IN EACH INSTANCE, EVEN IF DUE IN PART TO THE NEGLIGENCE, BREACH OF CONTRACT, BREACH OR VIOLATION OF A STATUTE, ORDINANCE, GOVERNMENTAL REGULATION, STANDARD, OR RULE, OR OTHER FAULT OF AN INDEMNIFIED PARTY, PROVIDED, HOWEVER, THAT CONTRACTOR'S OBLIGATION OF INDEMNIFICATION SHALL NOT EXTEND TO THE PERCENTAGE OF DAMAGES, INJURIES, EXPENSES, DEMANDS, CLAIMS, CAUSES OF ACTION, JUDGMENTS, LIABILITIES, COSTS AND FEES CAUSED BY THE INDEMNIFIED PARTIES.

THIS INDEMNITY AGREEMENT IS INTENDED TO MEET THE TEXAS "EXPRESS NEGLIGENCE RULE" BECAUSE CONTRACTOR AGREES THAT IT APPLIES AND IS ENFORCEABLE EVEN AS TO LOSSES, DAMAGES, INJURIES, EXPENSES, CLAIMS, CAUSES OF ACTION, JUDGMENTS OR LIABILITIES JOINTLY OR CONCURRENTLY CAUSED BY THE NEGLIGENCE OR OTHER FAULT OF THE INDEMNIFIED PARTIES. THE TERM "FAULT" IN THE PREVIOUS SENTENCE INCLUDES THE VIOLATION OR BREACH BY THE INDEMNIFIED PARTIES OF ANY COMMON LAW DUTY, ANY TERM OF THIS CONTRACT, OR ANY STATUTE OR REGULATION.

THIS INDEMNIFICATION OBLIGATION SHALL NOT BE LIMITED IN ANY WAY BY ANY OTHER PROVISION OF THIS CONTRACT OR BY ANY LIMITATIONS ON THE AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR PARTIES UNDER WORKERS' COMPENSATION ACTS, DISABILITY BENEFIT ACTS OR OTHER EMPLOYEE BENEFITS ACTS.

THIS INDEMNIFICATION OBLIGATION IS IN ADDITION TO ALL OTHER LEGAL, EQUITABLE, OR INDEMNIFICATION REMEDIES AVAILABLE TO THE INDEMNIFIED PARTIES. THIS INDEMNIFICATION OBLIGATION SURVIVES THE TERMINATION OR EXPIRATION OF THIS CONTRACT.

CONTRACTOR DOES HEREBY WAIVE, RELEASE AND FOREVER RELINQUISH AND DISCHARGE AUTHORITY FROM ALL OF CONTRACTOR'S CAUSES OF ACTION ARISING FROM BODILY INJURY OR DEATH OR DAMAGE TO ANY PROPERTY ARISING OUT OF THE WORK, REGARDLESS OF WHETHER THE INJURY OR DAMAGE IS CAUSED IN FULL OR IN PART BY THE NEGLIGENCE OR OTHER FAULT OF THE INDEMNIFIED PARTIES.

In the event that any statute, rule of law or equitable principle should be held applicable to any indemnity clause contained in this Contract in favor of one or more of the Indemnified Parties which would render void, voidable, or unenforceable any such indemnity clause as to any party by reason of any provisions contained therein, then and in only such event, such indemnity clause shall be deemed modified and read, construed and enforced as to such party with respect to the provisions held to violate the statute, rule of law or equitable principle to require indemnity by Contractor of the Indemnified Parties to the fullest extent required by such indemnity provision modified and limited only to the degree or extent necessary to bring such indemnity into compliance with such statute, rule of law or equitable principle, but otherwise, the indemnity shall remain in full force and effect and binding upon the parties hereto.

Each party hereto agrees and covenants that it will not contest the validity or enforceability of any indemnity or exculpatory provision of this Contract on the basis that the party has no notice or knowledge of such provision or that the provision is not “conspicuous.”

If other provisions contain any indemnities or limitations, such indemnities shall be deemed to be cumulative of and to operate independently of the indemnities provided herein to the end that all indemnities provided in the Contract shall be construed to grant indemnity to the Indemnified Parties to the fullest extent of each such indemnity.

Contractor shall include in each of its subcontracts with its subcontractors of every tier provisions the same as in all material respects those contained herein. Such provisions shall be for the benefit of and in favor of the Indemnified Parties and such other parties on whom Contractor and such subcontractors may agree.

Article 7.14. Contractor’s Responsibility for Work, Section B. Appurtenances is voided and replaced by the following:

B. Appurtenances.

1. Unreimbursed Repair. Except for destruction (not reusable) due to hurricanes, reimbursement will not be made for repair of damage to the following temporary appurtenances, regardless of cause:
 - signs,
 - barricades,
 - changeable message signs, and
 - other work zone traffic control devices.

Crash cushion attenuators and guardrail end treatments are the exception to the above listing and are to be reimbursed in accordance with Section 7.14.B.2, “Reimbursed Repair.”

For the devices listed in this section, reimbursement may be made for damage due to hurricanes. Where the contractor retains replaced appurtenances after completion of the

project, the Department will limit the reimbursement to the cost that is above the salvage value at the end of the project.

2. Reimbursed Repair. Reimbursement will be made for repair of damage due to the causes listed in Section 7.14.A, "Reimbursable Repair," to appurtenances (including temporary and permanent crash cushion attenuators and guardrail end treatments).

Article 7.14, Contractor's Responsibility for Work₂ is supplemented by the addition of the following paragraph:

- G. Contractor shall be responsible for any damage and/or delay to work performed by any other independent Contractor of the FBCTRA which is proximately caused by the negligence or willful act of the Contractor, his agents, employees, subcontractors and invitees.

Article 7.15. Electrical Requirements, Section A. Definitions, Section 3. Certified Person is voided and replaced by the following:

3. Certified Person. A certified person is a person who has passed the test from the TxDOT course TRF450, "TxDOT Roadway Illumination and Electrical Installations" or other courses as approved by the Traffic Operations Division. Submit a current and valid TRF certification upon request. On June 1, 2011, Texas Engineering Extension Service (TEEX) certifications for "TxDOT Electrical Systems" course will no longer be accepted. All TRF 450 certifications that have been issued for "TxDOT Roadway Illumination and Electrical Installations" course that expire before June 1, 2011 will be accepted until June 1, 2011.

Article 7.15. Electrical Requirements, Section A. Definitions, Section 4. Licensed Electrician is voided and replaced by the following:

4. Licensed Electrician. A licensed electrician is a person with a current and valid unrestricted master electrical license, or unrestricted journeyman electrical license that is supervised or directed by an unrestricted master electrician. An unrestricted master electrician need not be on the work locations at all times electrical work is being done, but the unrestricted master electrician must approve work performed by the unrestricted journeyman. Licensed electrician requirements by city ordinances do not apply to on state system work.

The unrestricted journeyman and unrestricted master electrical licenses must be issued by the Texas Department of Licensing and Regulation or by a city in Texas with a population of 50,000 or greater that issues licenses based on passing a written test and demonstrating experience.

The Engineer may accept other states' electrical licenses. Submit documentation of the requirements for obtaining that license. Acceptance of the license will be based on sufficient evidence that the license was issued based on:

- passing a test based on the NEC similar to that used by Texas licensing officials, and
- sufficient electrical experience commensurate with general standards for an unrestricted master and unrestricted journeyman electrician in the State of Texas.

Article 7.17, Personal Liability of Public Officials, is revised to read in its entirety as follows:

7.17 Personal Liability. In carrying out provisions of the Contract Documents or in exercising any power or authority granted there under, there shall be no liability for the Project Engineer, the Section Engineer(s), Construction Phase Engineer, their respective officers, employees, subcontractors, or authorized assistants, either personally or otherwise, as they are agents and representatives of the Authority, and there shall be no liability, either personal or otherwise for any member of the Commissioners' Court, of the FBCTRA or any of the FBCTRA's officers, employees, or consultants. Neither the Contract Document nor FBCTRA's or Contractor's course of conduct shall be deemed to create the relationship of principal and agent by and between the FBCTRA and the Contractor.

Article 7.19. Preservation of Cultural and Natural Resources and the Environment is supplemented by the following:

G. Asbestos Containing Material. In Texas, 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, Subpart M (NESHAP) 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.

Provide notice to the Department of demolition or renovation to the structures listed in the plans at least 30 calendar days prior to initiating demolition or renovation of each structure or load bearing member. Provide the scheduled start and completion date of structure demolition, renovation, or removal.

When demolition, renovation, or removal of load bearing members is planned for several phases, provide the start and completion dates identified by separate phases.

DSHS requires that notifications be postmarked at least 10 working days prior to initiating demolition or renovation. If the date of actual demolition, renovation, or removal is changed, the Department will be required to notify DSHS at least 10 days in advance of the work. This notification is also required when a previously scheduled (notification sent to DSHS) demolition, renovation or removal is delayed. Therefore, if the date of actual demolition, renovation, or removal is changed, provide the Engineer, in writing, 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.

Item 7 is supplemented by the addition of the following Articles:

Article 7.20 Contractor's Responsibility of Safety.

In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for conditions at the job site, including the safety of all persons and property during performance of the Work. The requirement will apply continuously and shall not be limited to normal working hours.

Article 7.21 Third Party Beneficiary.

The Contract shall not create any rights in third parties and no provision of the Contract shall be construed as creating any obligations for the benefit of, or rights in favor of, any person or entity other than the Authority, the Indemnified Parties, and the Contractor. Without limiting the foregoing, the Authority shall have no obligation to pay or to see to the payment of any monies due to any of Contractor's subcontractors or material suppliers of every tier or to any other person or entity.

Article 7.22 Indemnification and Hold Harmless for Telecommunications.

The contractor shall indemnify and hold harmless the FBCTRA from and against all costs, liability, and expense whatsoever (including, without limitation, attorney's fees, court costs and expense) arising out of any act or omission of the contractor, its agents and/or employees, that causes or contributes to (1) any damage to or destruction of any telecommunications system on the FBCTRA property, and (2) any injury to or death of any person employed by or on behalf of any telecommunications company, and/or its contractor, agents and/or employees, on the FBCTRA property. Contractor shall not have or seek recourse against the FBCTRA for any claim or cause of property. Contractor shall not have or seek recourse against the FBCTRA for any claim or cause of action alleged loss of profits or revenue or loss of service or other consequential damage to a telecommunication company using the FBCTRA's property or a customer or user of services of the fiber optic cable on the FBCTRA's property.

FORT BEND COUNTY TOLL ROAD AUTHORITY

SPECIAL PROVISION TO ITEM 8

PROSECUTION AND PROGRESS

For this project, Item 8 of the Texas Department of Transportation Standard Specifications is hereby amended with respect to the articles cited below and no other articles or requirements of this Item are waived or changed hereby.

Article 8.1, Prosecution of Work is revised by removing the first three sentences and replacing as follows:

8.1 Prosecution of Work. Prior to beginning construction operations, a preconstruction conference between the Contractor and the Engineer will be conducted. Prior to the preconstruction conference, The Contractor shall submit to the Engineer a preliminary CPM progress schedule which details the first 100 days of the contract in accordance with the requirements of Article 8.2, Progress Schedules. Within 30 calendar days following the preconstruction conference, the contractor shall submit the final version of the Contract Schedule. If the contractor fails to submit the initial schedule within the 30 days, the Engineer may withhold \$1,000 per day until an initial (baseline) schedule that complies with the specifications is submitted. The engineer will review the schedule within 7 days, and determine if the schedule is acceptable. If the schedule is not acceptable, the contractor will have 7 days to make the necessary changes. If the contractor fails to submit the revised and corrected initial schedule within the 30 days, the Engineer may withhold \$1,000 per day until an initial schedule that complies with the specifications is submitted.

Article 8.2B, Construction Contracts is revised to read in its entirety as follows:

8.2B Construction Contracts The Contractor must furnish a Critical Path Method schedule. Each schedule submittal must be accompanied by an electronic backup copy of the schedule. Schedules must be submitted at least monthly and must accompany each pay application. The schedule shall include all planned work activities and sequences. The initial schedule must utilize all of the contract time allowed in the contract. The schedule should incorporate major material procurements including preparation of shop drawings, submittals, fabrication and delivery of long lead items, known utility relocations, and other activities that may affect the completion of the Contract in the progress schedule. Each activity will be assigned a dollar value, the sum of which shall be equal to the adjusted contract value. The schedule activities must generally have durations shorter than one month and the work divided into discrete increments to allow easy identification of the specific task and simplify the updating process.

The Contractor may use Phoenix CPM Scheduling Software or Primavera P6. Schedules prepared and submitted in any other format will not be accepted.

The Engineer may require the Contractor to develop more detailed schedules for certain phases of the project such as major traffic changes, work requiring lane closures, or recovery schedules if the project falls behind schedule etc.

The contractor must provide a person proficient in CPM analysis to create and maintain the project schedule and be available when requested to meet with the Owner's Representative.

The CPM schedule must generally comply with construction industry standards as presented in "CPM in Construction" by James J. O'Brien or the AGC Guide to "Construction Planning and Scheduling". The schedule must have a clearly identifiable Critical Path. The Critical Path is defined as the longest path. It is the Fort Bend Grand Parkway Toll Road Authority's (the Authority) intention to conduct regular schedule update and review meetings with the Contractor to identify potential conflicts and opportunities on the project. The schedules submitted throughout the project will be essential elements in any delay claim.

The project schedule shall include but is not limited to the following:

- Begin the project schedule on the start date of contract time or start of compensable work on the project, whichever occurs first;
- Show the sequence and interdependence of activities required for complete performance of the work;
- Ensure all work sequences are logical and show a coordinated plan of the work;
- Show a predecessor and successor for each activity
- Clearly and accurately identify the critical path as the longest continuous path
- Provide a legend for all abbreviations and include the schedule filename, run date, data date, project start date, and project completion date in the title block of each schedule submittal;
- Through the use of calendars, incorporate seasonal weather conditions into the schedule for work (e.g., earthwork, concrete paving, structures, asphalt, drainage, etc.) that may be influenced by temperature or precipitation. Also, incorporate non work periods such as holidays, weekends, or other non-work days as identified in the Contract;
- No constraints or negative lags will be allowed.
- Show submittal and procurement periods.

For each activity on the project schedule provide:

- A logical activity number utilizing an alphanumeric designation system tied to the sequence of work and traffic control plans;
- A concise description of the work represented by the activity;
- An activity duration in days;
- The estimated quantity of work;

- Plan and incorporate resources, such as crews and heavy equipment, for each activity. Accurately represent the planned labor and equipment hours necessary to achieve the estimated productivity rates;
- Code the activities so that organized plots of the schedule may be produced;

The project schedule will be maintained for use by both the contractor and the Engineer. It will become an as-built record of the daily progress achieved on the project. In order to maintain an accurate as-built record of each activity, the actual start dates and finish dates must be recorded contemporaneously as they occur. If continuous progress of an activity is interrupted for any reason except non-work periods, such as holidays, weekends, or interference from temperature or precipitation, then the activity will be broken into a subsequent activity (or activities, based on the number of interruptions) similarly numbered with successive alpha character as necessary. The original duration of the subsequent activity will be that of the remaining duration of the original activity. Relationships of the subsequent activity will match those of the original activity so that the integrity of the project schedule logic is maintained. Once established the original durations and actual dates of all activities will remain unchanged.

Revisions to the schedule may be made as necessary. The project schedule shall be revised when changes in construction phasing and sequencing, changes in Traffic Control Plan, or other changes that cause deviation from the original project schedule occur. Any revisions to the schedule must be listed in the monthly updated narrative with the purpose of the revision and description of the impact on the schedule's critical path and project completion date.

The cut-off day for recording monthly progress will be established by the Project Engineer. Submit the updated schedule no later than the 1st work day of the following month.

A monthly update narrative will be included in the monthly schedule update. This narrative should include but is not limited to the following:

- The status of the project completion date, listing reasons why any change may have occurred;
- List all activities that have been added, deleted, or otherwise changed in the schedule with explanations for the modifications and description of the impacts each has on the project schedule;
- Any revisions that may have been performed to the schedule, providing the purpose of the revision and description of the impact to the project critical path and completion dates; and
- The status of the critical path, explaining reasons for any changes in critical path, impacts to the critical path that occurred during the period represented, or identifying any potential impacts that may occur in the next 3 months, including but not limited to material deliveries, utility and right way clearances, or other potential impacts.

No direct compensation will be made for fulfilling these requirements, as this work is considered subsidiary to the Item 500-2001, Mobilization. If the contractor does not submit the monthly schedule update by the 1st workday of the following month, the Engineer may withhold \$1,000 per day until an updated schedule that complies with the specifications is submitted.

Any amounts withheld by the Engineer for failure to comply with any part of Article 8.2 may be deducted from the Contract Amount by the Engineer at his discretion.

Article 8.3, Computation of Contract Time for Completion is voided and replaced with the following:

Time is of the essence of this Contract. All references to days are references to calendar days unless expressly stated otherwise. Calculation of Contract Time will commence on the Notice to Proceed date and run continuously for the duration of the contract.

The Contractor must achieve Substantial Completion within the contract duration specified.

The Contractor must achieve Final Completion no more than the number of days specified by the Engineer from the date of Substantial Completion.

Work shall begin on the date fixed in the Contract requisition. It shall be prosecuted regularly and without interruption until completion.

Article 8.5, Failure to Complete Work on Time, is voided and replaced by the following:

Failing to achieve Final Completion within the days specified by the Engineer the Contractor will be assessed liquidated damages of \$3,500 per day which will be withheld from any amount owed the Contractor. If the amount owed the Contractor is insufficient to withhold the amount, the Contractor shall pay the difference to the Authority.

The Project, of which the Work forms an essential part, is to be operated as a controlled access toll road project, and delay in completion of the Work of this Contract will cause delay in opening the Project to traffic and will cause losses to the Authority, including, but not limited to, lost revenue, interest on monies borrowed, increased administrative, legal and engineering costs, and other tangible and intangible losses. The liquidated damages set forth above are to cover partially such losses and expenses.

The Engineer may waive the collection of liquidated damages if the Work in its entirety, or any portion of the Work for which a date of completion is stipulated, has been substantially completed within the prescribed time of completion therefore.

If the Contractor fails to complete the Work within the time fixed by the Contract, or extensions thereof, and if the Engineer shall, nevertheless, permit the Contractor to continue and complete same, such permission shall neither modify nor waive any liability of the Contractor for damages arising from non-completion of the Work within the said time, but all such liabilities shall continue in full force against the Contractor

Item 8 is supplemented by the addition of the following Article:

8.11 Extension of Time - Control of the contract duration, completion date, and contract amount are essential elements of this contract and shall only be adjusted in writing by Change Order. A Change Order amending the contract duration and the contract completion date or the contract amount shall only be considered after the Contractor has made such a request in a timely manner accompanied

by proper documentation supporting such a request. The contract duration, completion date, and amount may not be adjusted by any other means.

Reasons for adjustment: The Engineer will consider adjustment of the contract duration, completion date, and contract amount for any changed condition or event which in the sole opinion of the Engineer is beyond the control of the Contractor; could not have been reasonably foreseen; and impacts the longest path on the properly prepared and submitted CPM schedule for the project.

Longest Path: Extensions of time will be granted only to the extent the changed conditions impact the longest path of the properly prepared CPM schedule. No extension of time will be granted for any change that does not impact the longest path, nor will any extension of time be granted for that portion of any delay event that is absorbed by float within the schedule.

Delays affecting activities not on the longest path by definition can not affect the completion date of the project and will not be considered as a reason to adjust the contract duration or the contract completion date but may be considered for cost impacts. In cases of non-critical delays the Contractor must provide timely documentation of the condition giving rise to the non-critical delay and documentation on the how the delay is causing the cost impact. All notice requirements contained in this provision pertain equally to critical as well as non-critical impacts without exception.

Timely notice of any impact is an essential element of this contract. The Contractor must provide the Engineer with notice of any delay which may impact the project completion date or impact cost within 7 calendar days from the commencement of the delay, or 7 calendar days from the date the Contractor should have reasonably been aware of the delay. Initial notice of the delay must be in writing and must generally describe the event or condition causing the delay and must specifically identify the schedule activities by activity ID and description which are being impacted, and generally the types and amounts of cost per day being incurred. The Contractor's initial notice shall also provide a brief explanation of why an alternative construction sequence eliminating or minimizing the delay is not possible or practical. This initial notice may be a letter containing all of the elements described above. The Engineer may request an immediate schedule review meeting with the Contractor upon notice of any delay to review the current CPM schedule and consider all possible alternatives.

FAILURE TO PROVIDE WRITTEN NOTICE WITHIN 7 CALENDAR DAYS OF THE COMMENCEMENT OF ANY DELAY MAY RESULT IN THE DENIAL OF ANY REQUEST FOR AN ADJUSTMENT TO THE CONTRACT DURATION, COMPLETION DATE, OR CONTRACT AMOUNT RESULTING FROM THAT DELAY.

The Impact of the Delay will be evaluated using the Time Impact Analysis method. A Time Impact Analysis consists of the following steps:

Step 1. Establish the status of the project immediately prior to the delay event or impact, or as near as practical prior to the commencement of the delay.

Step 2. Using the schedule produced in Step 1, add an activity to the schedule for the delay event with an estimated duration, or the actual duration of the delay event in the case of delay which has ended. Logically connect the added activity representing the delay event to the appropriate predecessor and successor activities to determine the impact to the completion date.

Step 3. Track the effects of the impact on the schedule during the occurrence by progressing the schedule monthly including the delay activity included in Step 2.

Step 4. Immediately after the conclusion of the delay event, or as near as practical after the delay event has ended, establish the status of the project and provide details identifying any mitigating actions or circumstances used to keep the project ongoing during the impact period.

Submit Step 1 and 2 with the Notice of Potential Time Impact. Incorporate Step 3 into schedule updates until impact is complete. Submit Step 4 with the Final Documentation, no later than 10 days after the completion of the impact.

Determine the time impact by comparing the status of the work prior to the impact (Step 1) to the prediction of the effect of the impact (Step 2), and to the actual effects of the impact once it is complete (step 4). All four steps of the Time Impact Analysis shall be completed before consideration of a Contract time extension or adjustment of milestone date will be provided.

Final Documentation. After the delay event or condition has ended the Contractor has 10 days to prepare and submit the final documentation of the impact of the delay including all cost impacts. An additional 30 days to prepare the final statement of impacts may be granted by the Engineer if requested by the Contractor in writing prior to the conclusion of the initial 10 day period. This documentation shall include a concise Time Impact Analysis Statement prepared using the submitted CPM schedules and a statement of all additional costs incurred as a result of the delay event or condition with backup documentation to support the claimed cost.

FAILURE TO PROVIDE WRITTEN DOCUMENTATION OF THE TIME AND COST IMPACT OF ANY DELAY WITHIN 10 DAYS OF THE CONCLUSION OF ANY DELAY MAY RESULT IN THE SUBSEQUENT DENIAL OF ANY REQUEST FOR AN ADJUSTMENT TO THE CONTRACT COMPLETION DATE OR COST IMPACTS.

END OF SPECIAL PROVISION

FORT BEND COUNTY TOLL ROAD AUTHORITY

SPECIAL PROVISION TO ITEM 9

MEASUREMENT AND PAYMENT

For the project, Item 9, "Measurement and Payment", of the Standard Specifications, is hereby modified with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

Article 9.5 A. Labor is voided and replaced by the following:

The Contractor will receive an additional 15% as compensation based on the total wages paid said laborers and foremen. For cost of premiums on public-liability and workers compensation insurance, social security and unemployment insurance taxes, an amount equal to 55 percent of the sum of the labor cost, excluding the 15 percent compensation provided above, will be paid to the Contractor.

Article 9.5 C. Materials is voided and replaced by the following:

The Contractor will receive the actual cost, including freight charges, of the materials used on such work to which cost will be added a sum equal to 15 percent thereof as compensation.

Article 9.6, Progress Payments. The first paragraph is voided and replaced by the following:

Once each month on a set day agreed to at the beginning of the contract, the Contractor shall provide the Engineer with his monthly estimate for quantities installed during the preceding month and the value thereof at the Contract unit prices.

In addition to the above, an estimate shall be made and included for acceptable structural steel, concrete members or units, and certain other structural components, and the Contractor shall furnish an affidavit that the material is stored in a bonded facility approved by the Fort Bend County Toll Road Authority. The estimate shall be made and included for 75 percent of the invoice material cost and invoice freight cost of materials involved after the Contractor has furnished the engineer with a copy of the paid invoices. Only materials requiring approved shop drawings, or where shop drawings are permitted due to quantities of units or because of stage construction, which are completely constructed and/or fabricated on the Contractor's order for a specific project, and on which an approved Test Report has been issued are eligible.

The Contractor shall submit, with each request for partial payment, an updated and current backup copy of the CPM Schedule per the Special Specification for CPM Schedules, **1310**. No request for payment will be processed without the appropriate schedule update.

Article 9.8 Final Payment. The following paragraphs are added:

The Contractor shall after completion of his contract submit his final estimate for quantities installed during the construction period and the value thereof at the Contract unit prices.

The Engineer shall approve and submit the final estimate to the Commissioners' Court and the County shall at such time or within thirty (30) days from and after the date of said estimate as the County may elect, pay the entire sum so found to be due after audit and approval by the County Auditor, after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the Contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment. It is mutually agreed between the parties to the Contract that no estimate or payment made under the Contract, except the final payment, shall exclude any claim of the County or shall constitute conclusive evidence of acceptable performance of the Contract either wholly or in part by the County; and no payments shall be construed to be an acceptance of any defective work or improper materials, or a release from any claims for damages. The Contractor hereby further agrees that the payment of the final amount due under the Contract and adjustment and payment of the bill rendered for any work done in accordance with any alterations to the Contract on a Change In Contract form shall release the County and the Engineer from any and all claims or liability on account of work performed under the Contract or alterations thereof. The Contractor agrees to examine the final estimate and, if he finds it correct, to execute thereon his release in full of all claims due by Fort Bend County, and to certify under oath to the payment by him of all claims against him for labor, materials, and supplies furnished by the Contractor by all persons and firms in the performance of the Contract.

Item 9 is supplemented by the addition of the following Article:

Article 9.9 Tax Exemptions. The bidder obligates himself, if awarded the Contract, to use reasonable diligence to obtain for the FBCTRA any and all exemptions from State or Federal excise or other tax if required to pay such taxes or if such taxes are paid, to assist the FBCTRA in any necessary way to obtain refund of such taxes so paid and to execute any required documents necessary to obtain refunds or to assert such exemptions.

SPECIAL PROVISION

100---002

Preparing Right of Way

For this project, Item 100, "Preparing Right of Way," 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 100.4. Payment. The second paragraph is voided and replaced by the following:

Total payment of this Item will not exceed 10% of the original contract amount until final acceptance. The remainder will be paid on the estimate after the final acceptance under Article 5.8, "Final Acceptance."

SPECIAL PROVISION**132---005****Embankment**

For this project, Item 132, “Embankment,” 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 132.2. Materials is supplemented with the following:

- **Type E.** Cement stabilized material consisting of Type C select backfill meeting the requirements of Article 423.2.C.2. Table 2. Select Backfill Gradation Limits and hydraulic cement meeting the requirements of DMS-4600, “Hydraulic Cement,” and the Department’s Hydraulic Cement Quality Monitoring Program (HCQMP). Sources not on the HCQMP will require testing and approval before use.

Article 132.2. Materials. The last paragraph is voided and not replaced.

Article 132.3.C. Embankment Adjacent to Culverts and Bridges is voided and replaced by the following:

Article 132.3.C. Embankment Adjacent to Culverts and Bridges. Except as noted below, in Article 132.3.D, compact embankments adjacent to culverts, under bridge approach slabs, and adjacent to abutments where using Wide Flange Terminal Anchorage systems but not cement stabilized embankment, in accordance with Item 400, “Excavation and Backfill for Structures.”

Article 132.3.D. Compaction Methods. The first paragraph is supplemented by the following:

When cement stabilized backfill embankment, reinforced volume embankment, retaining wall foundation improvements, or embankment foundation improvements are shown on the plans, compact each layer to the required density, in accordance with Article 276.4.C, “Compaction.”

Article 132.3.Construction is supplemented with the following:

G. Cement Stabilized Backfill Embankment (CSBE). Provide Type E material for cement stabilized backfill embankment. Place CSBE for embankments, retaining wall foundation improvements, embankment foundation improvements and backfill material placed between the reinforced volume of retaining walls in accordance with the requirements of Article 423.2.C.4, “Cement Stabilized Backfill” at the locations shown on the plans or as directed.

Article 132.5. 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 for at the unit price bid for “Embankment (Final),” “Embankment (Original),” or “Embankment (Vehicle),” of the compaction method and type specified. Where Cement Stabilized Backfill Embankment (CSBE) is shown on the plans, it will be paid for at the unit price bid for “Embankment (Final) (CSBE),” “Embankment (Final)(CSBE)(Retaining Wall Foundation Improvement),” “Embankment (Final)(CSBE)(Embankment Foundation Improvement),” or “Embankment (Final)(CSBE) (Reinforced Volume of Retaining Walls) of the compaction method and type shown on the plans. When the embankment adjacent to the cement stabilized reinforced volume is not cement stabilized, the cement stabilized reinforced volume will be paid as “Embankment (Final)” of the compaction method and type shown on the plans. This price is full compensation for all cement, cement treatment and stabilization, furnishing embankment, hauling, placing, compacting, curing, finishing, and reworking; disposal of waste material; and equipment, labor, tools, and incidentals.

SPECIAL PROVISION

132---011

Embankment

For this project, Item 132, “Embankment,” 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 132.3 Construction, Section D. Compaction Methods. The first paragraph, last sentence, is replaced by the following:

Compact embankments in accordance with Section 132.3.D.1, “Ordinary Compaction,” or Section 132.3.D.2, “Density Control,” as shown on the plans. Section 132.3.D.3, “Density Control by Computer-Generated (CG) Curve,” may be used by the contractor as an option for density control.

Article 132.3 Construction, Section D. Compaction Methods, is supplemented by the following:

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-compactant-lift thickness combination and CG Tex-114-E moisture-density curves based each lift 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-142-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 ($W_{f_{optcg}}$)
- Graph of CG laboratory and field compaction curves and the “Zero Air Voids Line”
- 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 ($W_{f_{optcg}}$) 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
Field Density Control Requirements

Description	Density	Moisture Content
	Tex-115-E	
$PI \leq 15$	$\geq 98\% D_{fcg}$	$\geq W_{f_{optcg}}$
$15 < PI \leq 35$	$\geq 98\% D_{fcg}$ and $\leq 102\% D_{fcg}$	$\geq W_{f_{optcg}}$
$PI > 35$	$\geq 95\% D_{acg}$ and $\leq 100\% D_{acg}$	$\geq W_{f_{optcg}}$

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 Construction, Section E. 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

164---004

Seeding for Erosion Control

Item 164, "Seeding for Erosion Control," 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 164.2.D. Cellulose Fiber Mulch is voided and replaced by the following:

Use only bonded fiber matrix that are on the approved list published in "Field Performance of Erosion Control Products," available from the Maintenance Division. Use material of the class and type as shown on the plans and provide a copy of the manufacturer's label for the selected product.

Article 164.3. Construction. The following is added after the first sentence:

Use approved equipment to vertically track the seedbed as shown on the plans or as directed by the Engineer.

Article 164.3.C. Cellulose Fiber Mulch Seeding is voided and replaced by the following:

C. Bonded Fiber Matrix Seeding. Plant seed according to Section 164.3.A, "Broadcast Seeding". Immediately after planting the seed or seed mixture, apply the bonded fiber matrix uniformly over the seeded area using suitable equipment. Applications should be made in accordance to the Product Installation Sheet published in "Field Performance of Erosion Control Products" available from the Maintenance Division.

Article 164.5. Payment is voided and replaced by the following:

The work performed and the materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Broadcast Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Broadcast Seeding (Temp)" of warm or cool season specified, "Straw or Hay Mulch Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Straw or Hay Mulch Seeding (Temp)" of warm or cool season specified, "Bonded Fiber Matrix Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Bonded Fiber Matrix Seeding (Temp)" of warm or cool season specified, "Drill Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Drill Seeding (Temp)" of warm or cool season specified, and "Straw or Hay Mulching." This price is full compensation for furnishing materials, including water for hydro-seeding and hydro-mulching operations, mowing, labor, equipment, tools, supplies, and incidentals. Fertilizer will not be paid for directly but will be subsidiary to this Item. Water for irrigating the seeded area, when specified, will be paid for under Item 168, "Vegetative Watering."

SPECIAL PROVISION

166---001

Fertilizer

Item 166, "Fertilizer," 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 166.2. Materials is voided and replaced by the following:

Use a complete fertilizer containing nitrogen (N), phosphoric acid (P), and potash (K) nutrients unless otherwise specified on the plans. At least 50% of the nitrogen component must be a slow-release sulfur coated urea. Ensure that fertilizer is in an acceptable condition for distribution in containers labeled with the analysis. Fertilizer is subject to testing by the Texas A&M Feed and Fertilizer Control Service in accordance with the Texas Fertilizer Law.

Article 166.3. Construction is voided and replaced by the following:

Deliver and apply the complete fertilizer uniformly at a rate equal to 60 lb. of nitrogen per acre or at the analysis and rate specified on the plans.

Apply fertilizer as a dry material and do not mix with water to form a slurry.

Incorporate fertilizer during seedbed preparation as specified in the plans.

SPECIAL PROVISION

260---003

Lime Treatment (Road-Mixed)

For this project, Item 260, "Lime Treatment (Road-Mixed)," 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 260.2. Materials, Section A. Lime. The first two sentences are voided and replaced by the following:

Furnish lime that meets the requirements of DMS-6350 "Lime and Lime Slurry," and DMS-6330, "Prequalification of Lime Sources." Use hydrated lime, commercial lime slurry, quicklime, or carbide lime slurry as shown on the plans.

Article 260.3. Equipment, Section B. Slurry Equipment. The last sentence of the second paragraph is voided and replaced by the following:

Equip the distributor truck with a sampling device in accordance with Tex-600-J, Part I, when using commercial lime slurry or carbide lime slurry.

Article 260.4. Construction, Section C. Application of Lime, Section 2. Slurry Placement. The first paragraph is voided and replaced with the following:

Provide slurry free of objectionable materials, at or above the minimum dry solids content, and with a uniform consistency that will allow ease of handling and uniform application. Deliver commercial lime slurry or carbide lime slurry to the jobsite, or use hydrated lime or quicklime to prepare lime slurry at the jobsite or other approved location, as specified. When dry quicklime is applied as a slurry, use 80 percent of the amount shown on the plans.

Article 260.4. Construction, Section D. Mixing. The third paragraph is voided and replaced with the following:

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

Article 260.5. Measurement, Section A. Lime is supplemented by the following:

4. Carbide Lime Slurry. Lime slurry will be measured by the ton (dry weight) as calculated from the minimum percent dry solids content of the slurry, multiplied by the weight of the slurry in tons delivered.

Article 260.6. 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 in accordance with Section 260.6.A, “Lime,” and Section 260.6.B, “Lime Treatment.”

Article 260.6. Payment, Section A. Lime. The first sentence is voided and replaced by the following:

A. Lime. Lime will be paid for at the unit price bid for "Lime" of one of the following types:

- Hydrated Lime (Dry),
- Hydrated Lime (Slurry),
- Commercial Lime Slurry,
- Quicklime (Dry),
- Quicklime (Slurry), or
- Carbide Lime Slurry.

Article 260.6. Payment, Section B. Lime Treatment is voided and replaced by the following:

B. Lime Treatment. Lime treatment will be paid for at the unit price bid for “Lime Treatment (Existing Material),” “Lime Treatment (New Base),” or “Lime Treatment (Mixing Existing Material and New Base),” for the depth specified. No payment will be made for thickness or width exceeding that shown on the plans. This price is full compensation for shaping existing material, loosening, mixing, pulverizing, spreading, applying lime, compacting, finishing, curing, curing materials, blading, shaping and maintaining shape, replacing mixture, disposing of loosened materials, processing, hauling, preparing secondary subgrade, water, equipment, labor, tools, and incidentals.

SPECIAL PROVISION

360---013

Concrete Pavement

For this project, Item 360, “Concrete Pavement,” 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 360.2. Materials, Section D. Epoxy is voided and replaced by the following:

Provide Type III, Class C epoxy in accordance with DMS-6100, “Epoxies and Adhesives,” for installing all drilled-in reinforcing steel. Request approval for the use of epoxy types other than Type III, Class C.

Article 360.3. Equipment, Section E. Curing Equipment. The third sentence is voided and replaced by the following:

Provide curing equipment that is independent of all other equipment when required to meet the requirements of Article 360.4.I, “Curing.”

Article 360.4. Construction, Section H. Spreading and Finishing, Section 2. Maintenance of Surface Moisture. The first and second sentences are voided and replaced by the following:

Prevent surface drying of the pavement before application of the curing system by means that may include water fogging, the use of wind screens, and the use of evaporation retardants.

Article 360.4. Construction, Section H. Spreading and Finishing, Section 3. Surface Texturing is voided and replaced by the following:

Complete final texturing before the concrete has attained its initial set. Drag the carpet longitudinally along the pavement surface with the carpet contact surface area adjusted to provide a satisfactory coarsely textured surface. Prevent the carpet from getting plugged with grout. Do not perform carpet dragging operations while there is excessive bleed water.

A metal-tine texture finish is required for all areas with a posted speed limit in excess of 45 mph. A metal-tine texture finish is required unless otherwise shown on the plans for areas with a posted speed limit less than 45 mph. Immediately following the carpet drag, apply a single coat of evaporation retardant at a 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 spaced at 1 in., 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 and other irregular 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.

When carpet drag is the only surface texture required by the plans, ensure that adequate and consistent micro-texture is achieved by applying sufficient weight to the carpet and keeping the carpet from getting plugged with grout, as directed by the Engineer. Target a carpet drag texture of 0.04 in., as measured by Tex 436-A. Correct any location with a texture less than 0.03 in. by diamond grinding or shot blasting. The Engineer will determine the test locations at points located transversely to the direction of traffic in the outside wheel path.

Article 360. 4. Construction, Section I. Curing. The first sentence is voided and replaced by the following:

Keep the concrete pavement surface from drying as described in Section 360.4.H.2, “Maintenance of Surface Moisture,” until the curing material has been applied.

Article 360. 4. Construction, Section I. Curing, Section 1. Membrane Curing. The first paragraph is voided and replaced by the following:

Spray the concrete surface uniformly with 2 coats of membrane curing compound at an individual application rate of not more than 180 sq. ft. per gal. Do not allow the concrete surface to dry before applying the curing compound. Use a towel or absorptive fabric to remove any standing pools of bleed water that may be present on the surface before applying the curing compound. Apply the first coat within 10 min. after completing texturing operations. Apply the second coat within 30 min. after completing texturing operations.

SPECIAL PROVISION

368---001

Concrete Pavement Terminals

For this project, Item 368, "Concrete Pavement Terminals," 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 368.5. Payment. The second paragraph is voided and replaced with the following:

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.

The last sentence of the third paragraph is voided.

SPECIAL PROVISION

420---001

Concrete Structures

For this project, Item 420, "Concrete Structures," 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 420.4. Construction, Section I, "Finish of Bridge Slabs". The tenth paragraph is supplemented with the following:

For bridge approach slabs the carpet drag, burlap drag, or broom finish may be applied either longitudinally or transversely.

Article 420.4. Construction, Section I, "Finish of Bridge Slabs". The first sentence of the fourteenth paragraph is voided and replaced by the following:

Unless noted otherwise, saw-cut grooves in the hardened concrete of bridge slabs, bridge approach slabs, and direct-traffic culverts to produce the final texturing after completion of the required curing period.

Article 420.4. Construction, Section I, "Finish of Bridge Slabs". The fourteenth paragraph is amended by the following:

When saw-cut grooves are not required in the plans, provide either a carpet drag or broom finish for micro-texture. In this case insure that an adequate and consistent micro-texture is achieved by applying sufficient weight to the carpet and keeping the carpet or broom from getting plugged with grout. For surfaces that do not have adequate texture, the Engineer may require corrective action including diamond grinding or shot blasting.

SPECIAL PROVISION

425---001

Precast Prestressed Concrete Structural Members

For this project, Item 425, “Precast Prestressed Concrete Structural Members,” 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 425.2. Materials is supplemented by the following:

For bridges with Type Tx28, Tx34, Tx40, Tx46, Tx54, Tx62 and/or Tx70 prestressed concrete girders, the contractor can submit an alternate design for approval using other TxDOT prestressed concrete girder shapes . Alternate designs must be signed, sealed, and dated by a Licensed Professional Engineer and submitted to the Engineer for review and approval. Use the same live load as the original design and adhere to the current versions of the AASHTO LRFD Bridge Design Specifications and the TxDOT LRFD Bridge Design Manual. Alternate bridge designs can differ from the original design only by type of girder used. Do not raise the roadway grade or lower the structure bottom chord elevation to accommodate the alternate girders. No other changes to the original geometry, including bent locations, are allowed. Substructure re-design may be necessary to accommodate the alternate girders.

Article 425.5. Payment is supplemented by the following:

No additional compensation will be made for alternate designs or for any increase in quantities required to accommodate alternate designs, including quantities paid for under other Items.

SPECIAL PROVISION

434---003

Elastomeric Bridge Bearings

For this project, Item 434, "Elastomeric Bridge Bearings," 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 434.1. Description. The third bullet is voided and replaced by the following:

- **Sliding Elastomeric Bearings.** Consisting of a steel top (sole) plate with a stainless steel facing (upper component) bearing on a lower component. The lower component may be either a layer of polytetrafluoroethylene (PTFE) bonded to a preformed fabric pad or a layer of PTFE recessed and bonded to a steel plate that is vulcanized to the top of a laminated elastomeric bearing pad with or without special components (steel guide bars and bottom plate).

Article 434.2. Materials, Section A. Plain and Laminated Elastomeric Bearings, Section 1. Elastomer. The fifth paragraph is voided and replaced by the following:

Plain sample bearings must measure 9 in. × 19 in. × 1 in. with 70-durometer hardness. Laminated sample bearings 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.

Article 434.2. Materials, Section A. Plain and Laminated Elastomeric Bearings is supplemented by the following:

5. **Coatings.** Provide coating materials as required in accordance with Item 445, "Galvanizing," and Item 446, "Cleaning and Painting Steel."

Article 434.2. Materials, Section B. Sliding Elastomeric Bearings, Section 1. Lower Component, Section b. PTFE. The second sentence is voided and not replaced.

Article 434.2. Materials, Section B. Sliding Elastomeric Bearings, Section 1. Lower Component is supplemented by the following:

- c. Laminated Elastomeric Bearing Pad.** Furnish laminated elastomeric bearing pads produced by a manufacturer prequalified by the Construction Division. Provide elastomer for laminated elastomeric bearing pads in accordance with Section 434.2.A.1, "Elastomer." Provide steel laminates for laminated elastomeric bearing pads in accordance with Section 434.2.A.2, "Steel Laminates." Provide steel plates for laminated elastomeric bearing pads in accordance with Section 434.2.A.3, "Steel Top Plates."

Article 434.2. Materials, Section B. Sliding Elastomeric Bearings is supplemented by the following:

4. **Coatings.** Provide coating materials as required in accordance with Item 445, "Galvanizing," and Item 446, "Cleaning and Painting Steel."

Article 434.3. Construction, Section A. Plain and Laminated Elastomeric Bearings, Section 4. Field Methods. The second paragraph is voided and replace by the following:

Field-weld as required in accordance with Item 448, "Structural Field Welding." Do not damage the elastomer when welding near bearings. Replace bearings damaged by field welding at the Contractor's expense.

Article 434.3 Construction, Section B. Sliding Elastomeric Bearings is voided and replaced by the following:

B. Sliding Elastomeric Bearings. Before fabrication of sliding elastomeric bearings, prepare and submit clear and legible shop drawings for the complete assembly in accordance with the plans and Section 441.3.A.6.b(2), "Non-Bridge Structures." Provide a bearing layout with the shop drawings.

Attach the stainless steel sheet to the steel top (sole) plate by continuous fillet-welding around the edges with an approved welding electrode. Do not extend the weld above the sliding surface. Protect the sliding surface from weld spatter. Provide the finished stainless steel surface flat to a tolerance of 1/32 in. After attachment to the steel plate, polish the stainless steel sheet to a bright mirror finish less than 20 micro-in. rms, and solvent-clean to remove traces of polishing compound.

For lower components with laminated elastomeric bearing pads, fabricate the laminated elastomeric bearing pads according to Section 434.3.A, "Plain and Laminated Elastomeric Bearings." Vulcanize the laminated elastomeric bearing pad to the PTFE faced steel plate. Machine the steel plate recessed surface flat to a tolerance of 1/32 in. and within 1/32 in. of required depth. Bond the PTFE material to the steel plate recessed surface with an approved adhesive. Fit the PTFE material into the recessed surface with not more than 1/32-in. gaps around the perimeter.

For lower components with preformed fabric pads, provide preformed fabric pads within the following tolerances from plan dimension:

- length and width: +1/4 in., -0 in., and
- thickness: +/-5%.

Bond the PTFE material to the preformed fabric pad using approved adhesive methods or by vulcanizing through an appropriate polychloroprene interlayer.

Perform required welding in accordance with Item 441, "Steel Structures." Manufacture guide bars when required so that 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 in. The maximum deviation for flatness of steel top (sole) plates, except at stainless steel attached surfaces, is 1/16 in. in any 24 in.

1. **Markings.** Mark the bearing type on the surface of each sliding elastomeric bearing. The marking must remain legible until placement in the structure. Permanently mark the laminated elastomeric bearing pad with the information specified in Section 434.3.A.1, "Markings."
2. **Testing and Acceptance.** For lower components with laminated elastomeric bearing pads, test a minimum of 10% of the sliding elastomeric bearing assemblies to an average compressive strength of 2,250 psi or a stress approved by the Engineer. Provide calibrated equipment per ASTM E 4 for this compression testing. No tested sliding elastomeric bearing may show visible damage to the PTFE or stainless steel surfaces nor evidence of bond failure between the:
 - PTFE faced steel plate and laminated elastomeric bearing pad,
 - steel laminates and elastomer within the laminated elastomeric bearing pad, and
 - steel plate and PTFE.

Perform check tests if necessary on the steel, laminated elastomeric bearing pads, preformed fabric pads, or PTFE material to verify the properties required under Section 434.2.B, "Sliding Elastomeric Bearings."

Bearings represented by test specimens passing the requirements of this Item will be approved for use in the structure subject to on-site inspection by the Engineer for visible defects.

- a. **Lower Component.** Manufacture 1 additional bearing lower component for testing purposes. After bearings have been manufactured for a project, notify the Construction Division, which will sample a bearing lower component at random from the lot. The Construction Division will perform a 90° peel test (adhesion test) to ensure that the sample meets a minimum required peel strength of:
 - 20 lb. per inch between the PTFE material and steel plate when tested per Tex 601-J, and
 - 25 lb. per inch between the PTFE material and preformed fabric pad when tested per ASTM D 429, Method B.

The Construction Division will also determine adhesion between the PTFE faced steel plate and laminated elastomeric bearing pad per Tex-601-J.

- b. **Documentation.** Furnish copies of certified mill test reports for the steel top (sole) plate, stainless steel, PTFE faced steel plate, and any required steel special components. Provide a manufacturer's certification that the preformed fabric pad and PTFE material meet the requirements of this Item. Furnish certified laboratory test results on the elastomer properties of each batch or lot of compound for laminated elastomeric bearing pads.
3. **Storage.** Store sliding elastomeric bearings horizontally in a dry, sheltered area. Provide moisture- and dust-resistant wrapping maintained in good condition until installation. Lift bearings only from the undersides. Protect bearings from damage, dirt, oil, grease, and other foreign substances.

- 4. Field Methods.** Provide concrete surfaces for bearing areas under sliding elastomeric bearings in accordance with Section 420.4.H, "Treatment and Finishing of Horizontal Surfaces Other Than Bridge Slabs."

Field-weld as required in accordance with Item 448, "Structural Field Welding." Avoid damage to the laminated elastomeric bearing pad or preformed fabric pad when welding near bearings. Bearings damaged by field welding will be replaced by the Contractor at the Contractor's expense.

Article 434.5. Payment, Section B. Sliding Elastomeric Bearings is voided and replaced by the following:

B. Sliding Elastomeric Bearings. 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 "Sliding Elastomeric Bearing" of the type specified. This price is full compensation for the stainless steel faced top plate, the PTFE faced steel plate vulcanized to the top of a laminated elastomeric bearing pad or the PTFE faced preformed fabric pad, the steel special components, the anchor bolts required to connect the bearing between superstructure and substructure; installation; and tools, equipment, labor, and incidentals.

SPECIAL PROVISION

442---016

Metal for Structures

For this project, Item 442, “Metal for Structures,” 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 442.2, “Materials,” Section A, “Structural Steel,” Section 1, “Bridge Structures.” The third sentence is voided and not replaced.

Article 442.5, “Payment,” is voided and replaced by the following:

442.5. 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 “Structural Steel” of the type (Rolled Beam, Plate Girder, Tub Girder, Box Girder, Railroad Through-Girder, Railroad Deck-Girder, Miscellaneous Bridge, Miscellaneous Non-Bridge) specified. This price is full compensation for materials, fabrication, transportation, erection, paint, painting, galvanizing, equipment, tools, labor, and incidentals.

SPECIAL PROVISION

450---001

Railing

For this project, Item 450, "Railing," 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 450.2. Materials is supplemented with the following:

Where epoxy anchors are allowed or required, provide an approved Type III, Class C epoxy in accordance with DMS-6100, "Epoxies and Adhesives," for installing drilled and epoxied rail anchorage reinforcement or rail anchor bolts. Use other materials if shown in the plans. Provide only dual cartridge epoxy systems mixed with a static mixing nozzle supplied by the epoxy adhesive manufacturer and dispensed with a tool supplied by the epoxy adhesive manufacturer. Do not use bulk epoxies. Drill and install anchorage reinforcement or anchor bolts to the embedment depth shown in the plans or the depth recommended by the manufacturer, whichever is deeper. No additional payment will be made for providing embedment deeper than shown in the plans. If no resistance or embedment depth is specified in the plans, select an embedment depth capable of developing the yield strength of the steel anchor.

Article 450.3. Construction, Section B. Concrete Railing. The last paragraph is voided and replaced by the following:

Obtain approval to slipform railing. Slipforming equipment must be approved. Do not slipform railing with cast-in-place anchor bolts unless noted otherwise. Provide additional reinforcing, at Contractor's expense, as needed to prevent movement of the reinforcement cage. Clear cover and epoxy coating requirements for additional reinforcement are the same as shown for the rail reinforcement. The rail reinforcing cage may be tack welded to the rail anchorage reinforcement provided the rail and anchorage reinforcement are not epoxy coated and weld locations measured along the rail are no closer than 3 ft. If epoxy coated reinforcement is required for the railing proposed to be slipformed, tie all bar intersections. Provide a wire line to maintain vertical and horizontal alignment of the slipform machine. Attach a grade line gauge or pointer to the machine so a continuous comparison can be made between the rail being placed and the established grade line. Rails or supports at the required grade are allowed instead of sensor controls. Prior to placing concrete, make one or more passes with the slipform over the rail segment to ensure proper operation and maintenance of grades and clearances. Provide slipformed rail within a vertical and horizontal alignment tolerance of +/- ¼ in. in 10 ft. Construct rail with a smooth and uniform appearance. Consolidate concrete so it is free of honeycomb. Provide concrete with a consistency that will maintain the shape of the rail without support. Minimize starting and stopping of the slipform operation by ensuring a continuous supply of concrete.

Do not exceed the manufacturer's recommended speed for the slipform machine. If slipforming causes movement of the reinforcement such that plan clearances are not achieved, stop slipforming and take remedial action. Remove and replace unsatisfactory slipformed rail at the Contractor's expense.

Install epoxy adhesive anchorages in accordance with the manufacturer's instructions including hole size, drilling equipment and method, hole cleaning equipment and method, mixing and dispensing epoxy, and anchor insertion. Do not alter the manufacturer's mixing nozzle or dispenser. Anchorage bars or bolts must be clean and free of grease, oil, or any other foreign material. Do not weld to an anchor bar or anchor bolt that is anchored with epoxy adhesive. Do not expose rail to traffic until epoxy adhesive has cured.

Article 450.3. Construction, Section C. Tests is supplemented with the following:

The Engineer will select three anchor bars or bolts of the first day's production to be tested after the epoxy has cured. Test the bars or bolts in the presence of the Engineer in accordance with ASTM E 1512, using a restrained test, to evaluate the epoxy adhesive's bond strength. Verify that the anchor bars or bolts develop the required pullout resistance in the plans or 75 percent of the yield strength of the bars or bolts, whichever is less, without a bond failure of the epoxy. The Engineer may require additional tests during production. If any of the tests do not meet the required test load, perform corrective measures to provide adequate capacity. Repair damage from testing.

Article 450.5. Payment is voided and replaced with 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 "Railing" of the type specified. This price will be full compensation for furnishing, preparing, and placing concrete, expansion joint material, reinforcing steel, structural steel, aluminum, cast steel, pipe, anchor bolts or bars, testing of epoxy anchors, and all other materials required in the finished railing; removal and disposal of salvageable materials; and hardware, paint and painting of metal railing, galvanizing, equipment, labor, tools, and incidentals.

SPECIAL PROVISION

454---003

Bridge Expansion Joints

Item 454, "Bridge Expansion Joints," 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 454.2, Materials. Void the first paragraph and replace with the following:

Provide materials in accordance with the requirements of the following Items:

- Item 442, "Metal for Structures"
- DMS-6140, "Polymer Concrete for Bridge Joint Systems"
- DMS-6310, "Joint Sealants and Fillers," Class 1 (Two-Component Polyurethane, Rapid-Curing, Self-Leveling) or Class 7 (Low-Modulus Silicone, Rapid-Curing, Self-Leveling)
- ASTM D 5973, "Standard Specification for Elastomeric Strip Seals with Steel Locking Edge Rails Used in Expansion Joint Sealing."

SPECIAL PROVISION

462---015

Concrete Box Culverts and Storm Drains

For this project, Item, 462, “Concrete Box Culverts and Storm Drains,” 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 462.2. Materials, Section A. General. The last two paragraphs are voided and replaced by the following:

Furnish material for machine-made precast boxes in accordance with DMS-7310, “Reinforced Concrete Pipe and Machine-Made Precast Box Culvert Fabrication and Plant Qualification.”

Article 462.2. Materials, Section B. Fabrication, 3. Machine-Made Precast is voided and replaced by the following:

Machine-made precast box culvert fabrication plants must be approved in accordance with DMS-7310, “Reinforced Concrete Pipe and Machine-Made Precast Box Culvert Fabrication and Plant Qualification.” The Construction Division maintains a list of approved machine-made precast box culvert plants.

Fabricate machine-made precast boxes in accordance with DMS-7310.

Article 462.2. Materials, Section C. Testing, 2. Formed Precast is voided and replaced by the following:

Make, cure, and test compressive test specimens in accordance with Tex-704-I.

Article 462.2 Materials, Section C. Testing, 3. Machine-Made Precast is voided and replaced by the following:

Make, cure, and test compressive test specimens in accordance with DMS-7310.

Article 462.2. Materials, Section D. Lifting Holes. The first paragraph is voided and replaced by the following:

For precast boxes, provide no more than 4 lifting holes in each section. Lifting holes may be cast, cut into fresh concrete after form removal, or drilled. Provide lifting holes of sufficient size for adequate lifting devices based on the size and weight of the box section. Do not use lifting holes larger than 3 in. in diameter. Do not cut more than 5 in. in any direction of reinforcement per layer for lifting holes.

Article 462.2. Materials, Section E. Marking. The first paragraph is voided and replaced by the following:

Mark precast boxes with the following:

- name or trademark of fabricator and plant location;
- ASTM designation;
- date of manufacture;
- box size;
- minimum and maximum fill heights;
- designated fabricator's approval stamp;
- boxes to be used for jacking and boring (when applicable);
- designation "SR" for boxes meeting sulfate-resistant concrete plan requirements (when applicable); and
- match marks for proper installation, when required under Section 462.2.F, "Tolerances."

Article 462.2. Materials, Section F. Tolerances. is voided and replaced by the following:

Ensure that precast sections meet the permissible variations listed in ASTM C 1577 and the following requirement:

- The sides of a section at each end do not vary from being perpendicular to the top and bottom by more than 1/2 in. when measured diagonally between opposite interior corners.

Ensure that wall and slab thicknesses are not less than shown on the plans except for occasional deficiencies not greater than 3/16 in. or 5%, whichever is greater. If proper jointing is not affected, thicknesses in excess of plan requirements are acceptable.

Deviations from the above tolerances will be acceptable if the sections can be fitted at the plant or job site and the joint opening at any point does not exceed 1 in. Use match marks for proper installation on sections that have been accepted in this manner.

1. Boxes for Jacking Operations. For boxes to be used for jacking operations (as defined in Item 476, "Jacking, Boring, or Tunneling Pipe or Box,") meet the following additional requirements:

- The box ends must be square such that no point deviates more than 3/8 in. from a plane placed on the end of the box that is perpendicular to the box sides, and
- The slab and wall thicknesses must not be less than specified on the plans and must not exceed the specified thickness by more than 1/2 in.

Article 462.2. Materials, Section G. Defects and Repair. The following paragraph is added:

Repair machine-made precast boxes in accordance with DMS-7310, "Reinforced Concrete Pipe and Machine-Made Precast Box Culvert Fabrication and Plant Qualification."

Article 462.2. Materials, Section H. Storage and Shipment. The following paragraph is added:

Store and ship machine-made precast boxes in accordance with DMS-7310, “Reinforced Concrete Pipe and Machine-Made Precast Box Culvert Fabrication and Plant Qualification.”

Article 462.3 Construction, Section C. Jointing. The first paragraph is voided and replaced by the following:

Unless otherwise shown on the plans, use any of the jointing materials in accordance with the joint requirements specified in Item 464, “Reinforced Concrete Pipe.” Rubber gasketed joints may be substituted for tongue and groove joints, provided they meet the requirements of ASTM C 1677 for design of the joints and permissible variations in dimensions.

SPECIAL PROVISION

464---006

Reinforced Concrete Pipe

For this project, 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.

Article 464.2. Materials, Section A. Fabrication is voided and replaced by the following:

Fabrication plants must be approved by the Construction Division in accordance with DMS-7310, “Reinforced Concrete Pipe and Machine-Made Precast Concrete Box Culvert Fabrication and Plant Qualification,” before furnishing precast reinforced concrete pipe for Department projects. The Construction Division maintains a list of approved reinforced concrete pipe plants.

Furnish material and fabricate reinforced concrete pipe in accordance with DMS-7310, “Reinforced Concrete Pipe and Machine-Made Precast Concrete Box Culvert Fabrication and Plant Qualification.”

Article 464.2. Materials, Section B. Design, 1. General. Table 2 is voided and replaced by the following:

**Table 2
Arch Pipe**

Design Size	Equivalent Diameter (in.)	Rise (in.)	Span (in.)
1	18	13-1/2	22
2	21	15-1/2	26
3	24	18	28-1/2
4	30	22-1/2	36-1/4
5	36	26-5/8	43-3/4
6	42	31-5/16	51-1/8
7	48	36	58-1/2
8	54	40	65
9	60	45	73
10	72	54	88

Article 464.2 Materials, Section C. Physical Test Requirements is voided and not replaced.

Article 464.2. Materials, Section D. Markings. The first paragraph is voided and replaced by the following:

Furnish each section of reinforced concrete pipe marked with the following information specified in DMS-7310, “Reinforced Concrete Pipe and Machine-Made Precast Concrete Box Culvert Fabrication and Plant Qualification”:

- class or D-Load of pipe,
- ASTM designation,
- date of manufacture,
- pipe size,
- name or trademark of fabricator and plant location,
- designated fabricator’s approval stamp,
- pipe to be used for jacking and boring (when applicable), and
- designation “SR” for pipe meeting sulfate-resistant concrete plan requirements (when applicable).

Article 464.2. Materials, Section E. Inspection is voided and replaced by the following:

Provide access for inspection of the finished pipe at the project site before and during installation.

Article 464.2. Materials, Section F. Causes for Rejection is voided and replaced by the following:

Individual section of pipe may be rejected for any of the conditions stated in the Annex of DMS-7310, “Reinforced Concrete Pipe and Machine-Made Precast Concrete Box Culvert Fabrication and Plant Qualification.”

Article 464.2. Materials, Section G. Repairs is voided and replaced by the following:

Make repairs if necessary as stated in the Annex of DMS-7310, “Reinforced Concrete Pipe and Machine-Made Precast Concrete Box Culvert Fabrication and Plant Qualification.”

Article 464.2. Materials, Section H. Rejections is voided and not replaced.

SPECIAL PROVISION**465---002****Manholes and Inlets**

For this project, Item 465, "Manholes and Inlets," of the Standard Specifications, is hereby voided and replaced with the articles below.

465.1 Description. Construct manholes and inlets, complete in place or to the stage detailed, including furnishing and installing frames, grates, rings and covers. Drainage junction boxes are classified as manholes.

465.2 Materials. Furnish materials in accordance with the followings:

- Item 420, "Concrete Structures"
- Item 421, "Hydraulic Cement Concrete"
- Item 440, "Reinforcing Steel"
- Item 471, "Frames, Grates, Rings, and Covers"

Cast-in-place manholes, inlets, risers, and appurtenances are acceptable unless otherwise shown. Alternate designs for cast-in-place items must be acceptable to the Engineer and must conform to functional dimensions and design loading. Alternate designs must be designed and sealed by a licensed professional engineer.

- A. Concrete.** Furnish Class H concrete for formed precast manholes and inlets. Furnish concrete per DMS-7310 for machine-made precast manholes and inlets. Air-entrained concrete will not be required in precast concrete members. Furnish Class C concrete for cast-in-place manholes and inlets unless otherwise shown on the plans.
- B. Mortar.** Furnish Type S mortar in accordance with ASTM C270.
- C. Timber.** Provide sound timber for temporary covers when used with Stage I construction (see Section 465.3, "Construction") that is a minimum of 3 in. nominal thickness and reasonably free of knots and warps.
- D. Other Materials.** Commercial-type hardware of other materials may be used with prior approval.

465.3 Construction. All types of manholes and inlets may be built either complete or in 2 stages, described as Stage I and Stage II. Build manholes and inlets designed to match the final roadway surface.

Construct the Stage I portion of manholes and inlets as shown on the plans or as specified in this Item. Furnish and install a temporary cover as approved by the Engineer.

For Stage I construction of cast iron or steel inlet units, furnish and install the storm drain pipe and a temporary plug for the exposed end of the storm drain pipe from the storm drain to a point below the top of curb indicated on the plans.

Construct Stage II after the pavement structure is substantially complete unless otherwise approved by the Engineer.

For Stage II, construct the remaining wall height and top of manhole or inlet and furnish and install any frames, grates, rings and covers, manhole steps, curb beams, or collecting basins required.

Construct cast-in-place manholes and inlets in accordance with Item 420, "Concrete Structures." Forms will be required for all concrete walls. Outside wall forms for cast-in-place concrete may be omitted with the approval of the Engineer if the surrounding material can be trimmed to a smooth vertical face.

A. Precast Manholes and Inlets. Construct formed precast manholes and inlets in accordance with Item 420, except as otherwise noted in this Item. Construct machine-made precast manholes and inlets in accordance with ASTM C 478, except as otherwise noted in this Item. Mix and place concrete for machine-made manholes and inlets per the requirements of DMS-7310. Conform to the product permissible variations and rejection criteria stated in ASTM C 478 for machine-made precast manholes and inlets. Cure all precast units in accordance with Item 424, "Precast Concrete Structures (Fabrication)."

Multi-project fabrication plants (as defined in Item 424, "Precast Concrete Structures (Fabrication)") that produce manholes and inlets will be approved by the Construction Division in accordance with DMS-7340, "Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Manholes and Inlets." The Construction Division maintains a list of approved multi-project plants.

1. **Lifting Holes.** For precast units, provide no more than 4 lifting holes in each section. Lifting holes may be cast, cut into fresh concrete after form removal, or drilled. Provide lifting holes large enough for adequate lifting devices based on the size and weight of the section. The maximum hole diameter is 3 in. at the inside surface of the wall and 4 in. at the outside surface. Do not cut more than 5 in. in any direction of reinforcement per layer for lifting holes. Repair spalled areas around lifting holes.
2. **Marking.** Clearly mark each precast 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;
 - designated fabricator's approval stamp; and
 - designation "SR" for product meeting sulfate-resistant concrete plan requirements (when applicable).

3. **Storage and Shipment.** Store precast units on a level surface. Do not ship units until design strength requirements have been met.
- B. Excavation, Shaping, Bedding, and Backfill.** Excavate, shape, bed, and backfill in accordance with Item 400, "Excavation and Backfill for Structures." For all manhole and inlet structures where joints consist of rubber boots, rubber gaskets, bulk or preformed joint sealant, immediate backfilling is permitted. Take precautions in placing and compacting the backfill to avoid any movement of manholes and inlets. Remove and replace manholes and inlets damaged by the Contractor at no expense to the Department.
- C. Manholes and Inlets for Precast Concrete Pipe Storm Drains.** Construct manholes and inlets for precast concrete pipe storm drains as soon as is practicable after storm drain lines into or through the manhole or inlet locations are completed. Neatly cut all storm drains at the inside face of the walls of the manhole or inlet and point up with mortar.
- D. Manholes and Inlets for Monolithic Pipe Storm Drains.** Construct bases for manholes and inlets on monolithic pipe storm drains either monolithically with the storm drain or after the storm drain is constructed.
- E. Manholes for Box Storm Drains.** Cast bases for manholes for box storm drains as an integral part of the storm drain. Construct manholes before backfilling, or cover the manhole opening temporarily and backfill the storm drain as a whole.
- F. Inverts.** Shape and route floor inverts passing out or through the manhole or inlet as shown on the plans. Shape by adding and shaping mortar or concrete after the base is cast or by placing the required additional material with the base.
- G. Finishing Complete Manholes and Inlets.** Complete manholes and inlets in accordance with the plans. Backfill to original ground elevation in accordance with Item 400, "Excavation and Backfill for Structures."
- H. Finishing Stage I Construction.** Complete Stage I construction by constructing the walls to the elevations shown on the plans and backfilling to required elevations in accordance with Item 400, "Excavation and Backfill for Structures."
- I. Stage II Construction.** Construct subgrade and base course or concrete pavement construction over Stage I manhole or inlet construction, unless otherwise approved by the Engineer. Excavate to expose the top of Stage I construction and complete the manhole or inlet in accordance with the plans and these Specifications, including backfill and cleaning of all debris from the bottom of the manhole or inlet.
- J. Inlet Units.** Install cast iron or steel inlet units in conjunction with the construction of concrete curb and gutter. Set the inlet units securely in position before placing concrete for curb and gutter. Form openings for the inlets and recesses in curb and gutter as shown on the plans. Place and thoroughly consolidate concrete for curb and gutter adjacent to inlets and around the inlet castings and formed openings and recesses without displacing the inlet units.

465.4 Measurement. All manholes and inlets satisfactorily completed in accordance with the plans and specifications will be measured by each manhole or inlet, complete, or by each manhole or inlet completed to the stage of construction required by the plans.

465.5 Payment. The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for as follows:

- A. Complete Manholes.** Payment for complete manholes will be made at the unit price bid for “Manhole (Complete)” of the type specified.
- B. Complete Inlets.** Payment for inlets will be made at the unit price bid for “Inlet (Complete),” of the type specified.
- C. Manholes Stage I.** Payment for Manholes, Stage I, will be made at the unit price bid for each “Manhole (Stage I)” of the type specified.
- D. Manholes Stage II.** Payment for Manholes, Stage II, will be made at the unit price bid for each “Manhole (Stage II)” of the type specified.
- E. Inlets Stage I.** Payment for Inlets, Stage I, will be made at the unit price bid for each “Inlet (Stage I)” of the type specified.
- F. Inlets Stage II.** Payment for Inlets, Stage II, will be made at the unit price bid for each “Inlet (Stage II)” of the type specified.

These price are full compensation for concrete, reinforcing steel, mortar, frames, grates, rings and covers, excavation, and backfill and for all other materials, tools, equipment, labor, and incidentals

SPECIAL PROVISION

476---003

Jacking, Boring, or Tunneling Pipe or Box

For this project, Item 476, "Jacking, Boring, or Tunneling Pipe or Box," 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 476.3. Construction, Section A. Jacking. The third paragraph is voided and replaced by the following:

Ensure that excavation for the underside of the pipe for at least 1/3 of the circumference of the pipe conforms to the contour and grade of the pipe. Ensure that the excavation for the bottom slab of the box conforms to the grade of the box. If desired, over excavate to provide not more than 2 in. of clearance for the upper portion of the pipe or box. Taper this clearance to zero at the point where the excavation conforms to the contour of the pipe or box. When jacking of pipe has begun, the operation shall be carried on without interruption, insofar as practicable, to prevent the pipe from becoming firmly set in the embankment. Pressure-grout any over excavation of more than 1 in. When shown on the plans, pressure-grout between the carrier pipe and casing.

Article 476.3. Construction, Section B. Boring. The fifth paragraph is voided and replaced by the following:

1. **Larger Diameter Boring Methods.** For drainage and large utility borings, use the pilot hole or auger method. Pressure-grout any over excavation of more than 1 in. When shown on the plans, pressure-grout between the carrier pipe and casing.
 - a. **Pilot Hole Method.** Bore a 2 in. pilot hole the entire length of the crossing, and check it for line and grade on the opposite end of the bore from the work shaft. This pilot hole will serve as centerline for the larger diameter hole to be bored.
 - b. **Auger Method.** Use a steel encasement pipe of the appropriate diameter equipped with a cutter head to mechanically perform the excavation. Use augers of sufficient diameter to convey the excavated material to the work shaft.
2. **Electrical and Communication Conduit Boring.** For electrical and communication conduit borings, limit over excavation to the dimensions shown in Table 1. Increased boring diameters will be allowed for outer diameters of casing and couplings. Pressure grouting will not be required for electrical and communication conduit borings.

Table 1

Allowable Bore Diameter for Electrical or Communication Conduit or Casing

Single Conduit Bores		Multiple Conduit Bores	
Conduit Size (in.)	Maximum Allowable Bore (in.)	Conduit Size (in.)¹	Maximum Allowable Bore (in.)
2	4	4	6
3	6	5	8
4	6	6	10
6	10	7	12
		8	12

1. The diameter of multiple conduits is the sum of the outside diameter of the two largest conduits for placement of up to 4 conduits in one bore. Submit boring diameters for the Engineer's approval when more than 4 conduits are to be placed in a bore.

Article 476.3. Construction, Section C. Tunneling is supplemented by the following:

When shown on the plans, pressure-grout between the carrier pipe and liner plate.

SPECIAL PROVISION

500---011

Mobilization

For this project, Item 500, "Mobilization," 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 500.1. Description is supplemented by the following:

Work for this Item includes submissions required by the Contract.

Article 500.3. Payment, Section A is voided and replaced by the following:

A. Payment will be made upon presentation of a paid invoice for the payment or performance bonds and required insurance. The combined payment for bonds and insurance will be no more than 10% of the mobilization lump sum or 1% of the total Contract amount, whichever is less. However, payment will be made for the actual cost of the paid invoice when the combined payment for bonds and insurance exceeds 10% of the mobilization lump sum or 1% of the total Contract amount, whichever is less.

Article 500.3. Payment, Section F is voided and replaced by the following:

F. Upon final acceptance, 97% of the mobilization lump sum bid will be paid. Previous payments under this Item will be deducted from this amount.

Article 500.3. Payment is supplemented by the following:

G. Payment for the remainder of the lump sum bid for "Mobilization" will be made after all submittals are received, final quantities have been determined and when any separate vegetative establishment and maintenance, test and performance periods provided for in the Contract have been successfully completed.

SPECIAL PROVISION

502---033

Barricades, Signs, and Traffic Handling

For this project, 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 502.4. Payment, Section C. Maximum Total Payment Prior to Acceptance is voided and replaced by the following:

C. Maximum Total Payment Prior to Acceptance. The total payment for this Item will not exceed 10% of the total Contract amount before final acceptance in accordance with Article 5.8, "Final Acceptance." The remaining balance will be paid in accordance with Section 502.4.E, "Balance Due."

SPECIAL PROVISION

512---002

Portable Concrete Traffic Barrier

For this project, Item 512, “Portable Concrete Traffic Barrier,” 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 512.2. Materials. The first paragraph is supplemented by the following:

For precast concrete traffic barrier,

- Furnish the class of concrete shown on the plans. Air-entrained concrete will not be required, unless otherwise shown on the plans.
- Use a minimum of 25% Class F fly ash with mix design Option 1 from Section 421.4.A.6, “Mix Design Options.”
- Do not use mix design Options 6, 7, or 8 from Section 421.4.A.6., “Mix Design Options.”

Article 512.3. Construction. The second sentence of the first paragraph is voided and replaced by the following:

Multi-project fabrication plants as defined in Item 424, “Precast Concrete Structures (Fabrication)” that produce concrete traffic barrier, except temporary barrier furnished and retained by the Contractor, must be approved in accordance with DMS-7350, “Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Traffic Barrier.”

SPECIAL PROVISION

514---002

Permanent Concrete Traffic Barrier

For this project, Item 514, “Permanent Concrete Traffic Barrier,” 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 514.2. Materials is supplemented by the following:

For precast concrete traffic barrier,

- Air-entrained concrete will not be required in precast concrete traffic barrier, unless otherwise shown on the plans.
- Use a minimum of 25% Class F fly ash with mix design Option 1 from Section 421.4.A.6, “Mix Design Options.”
- Do not use mix design Options 6, 7, or 8 from Section 421.4.A.6., “Mix Design Options.”

SPECIAL PROVISION

610---015

Roadway Illumination Assemblies

For this project, Item 610, "Roadway Illumination Assemblies," 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 610.2. Materials. The fourth paragraph is voided and replaced by the following:

Do not provide shop drawings for complete assemblies that are fabricated in accordance with this Item and standard details shown on the plans. Electronically submit shop drawings for optional multi-sided steel pole designs, optional aluminum pole designs, and non-standard designs required when basic wind speeds and/or pole base mounting heights at the installation locations are in excess of that shown on the Roadway Illumination Pole (RIP) standard. Manufacturers may request that the Department add the shop drawings and design calculations they submit for this Item to a pre-approved list of optional and non-standard pole designs. The submittal requirements and procedures for these optional and non-standard illumination pole shop drawings and calculations are linked to the "Shop Drawings" page located online at:

http://www.dot.state.tx.us/business/contractors_consultants/bridge/shop_drawings/default.htm

SPECIAL PROVISION

620---001

Electrical Conductors

For this project, Item 620, "Electrical Conductors," 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 620.2 Materials. The fourth and fifth paragraphs are void and replaced by the following:

Use white insulation for grounded (neutral) conductors, except that grounded conductors AWG No. 4 and larger may be black with white tape marking at every accessible location. Do not use white insulation or marking for any other conductor except control wiring specifically shown on the plans.

Ensure that insulated grounding conductors are green except that insulated grounding conductors AWG No. 4 and larger may be black with green tape marking at every accessible location. Do not use green insulation or marking for any other conductor except control wiring specifically shown on the plans.

SPECIAL PROVISION

624---014

Ground Boxes

For this project, Item 624, "Ground Boxes," 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 624.1. Description is voided and replaced by the following:

Construct, furnish, and install ground boxes complete with lids. Remove existing ground boxes.

Article 624.2 Construction and Materials. The first paragraph is voided and replaced by the following:

Provide new materials that comply with the details shown on the plans and meet the following requirements:

- Construct cast-in-place concrete ground boxes and aprons in accordance with Item 420, "Concrete Structures," and Item 440, "Reinforcing Steel."
- Provide fabricated precast polymer concrete ground boxes, and precast concrete ground boxes that comply with DMS-11070, "Ground Boxes."
- Construct a concrete apron, when shown on the plans, in accordance with Item 432, "Riprap," and Item 440, "Reinforcing Steel."

Article 624.2. Construction and Materials is supplemented by the following:

Remove existing ground boxes to at least 6 in. below the conduit level. Uncover conduit to a sufficient distance so that 90 degree bends can be removed and conduit reconnected. Clean the conduit in accordance with Item 618, "Conduit" and pull, splice, or terminate new conductors as indicated in the plans. Cleaning of conduit is subsidiary to this Item. Pulling, splicing, or terminating conductors will be paid under Item 620, "Electrical Conductors." Backfill area to ground level with acceptable material upon completing adjacent work related to conduit and conductors.

Article 624.3. Measurement is voided and replaced by the following:

This Item will be measured by each ground box complete in place or by each ground box removed.

Article 624.4. Payment 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 for at the unit price bid for "Ground Boxes" of the types and sizes specified and for "Remove Existing Ground Boxes." This price is full compensation for excavating and backfilling; constructing, furnishing, installing, and removing the ground boxes and concrete aprons when required; and equipment, labor, materials, tools, and incidentals.

SPECIAL PROVISION

628---003

Electrical Services

For this project, Item 628, "Electrical Services," 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 628.5. Payment, A. Installation is voided and replaced by the following:

A. Installation. Except as provided for in the following paragraph, this price is full compensation for paying all fees, permits, and other costs; making arrangements with the utility company for all work and materials provided by the utility company; furnishing, installing, and connecting all components including poles, service supports, foundations, anchor bolts, riprap, enclosures, switches, breakers, conduit (from the service equipment including the elbow below ground), fittings, conductors (from the service equipment including the elbow below ground), brackets, bolts, hangers, and hardware; and equipment, labor, tools, and incidentals.

Costs for utility-owned power line extensions, connection charges, meter charges, and other charges will be paid for by the Department. The Department will reimburse the contractor the amount billed by the utility plus an additional 5% of the invoice cost will be paid for labor, equipment, administrative costs, superintendence, and profit.

SPECIAL PROVISION

636---014

Aluminum Signs

For this project, Item 636, "Aluminum 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.

Article 636.1. Description is voided and replaced by the following:

- **Installation.** Furnish, fabricate, and erect signs. Sign supports are provided for under other Items.
- **Replacement.** Replace existing signs on existing sign supports.
- **Refurbishing.** Refurbish existing signs on existing sign supports.

Article 636.2. Materials, Section A. Sign Blanks is voided and replaced by the following:

- A. Sign Blanks.** Furnish sign blank substrates in accordance with DMS-7110, "Aluminum Sign Blanks" or DMS-8305, "Fiberglass Sign Substrate," and in accordance with the types shown on the plans. Use single-piece sheet-aluminum substrates for Type A (small) signs. Use either extruded aluminum or fiberglass substrates for Type G (ground-mounted) or Type O (overhead-mounted) signs as shown on the plans.

Article 636.2. Materials, Section B. Sign Face Reflectorization is supplemented by the following:

Ensure that sign legend, symbols, borders, and background exhibit uniform color, appearance, and retroreflectivity when viewed both day and night.

Article 636.2. Materials, Section C. Sign Messages. The last two bullets are voided and replaced by the following:

- Fabricate non-reflective black film legend from materials meeting DMS-8300.
- Furnish direct-applied route markers and other attachments within the parent sign face, unless otherwise specified in the plans.

Article 636.2. Materials, Section D. Hardware is supplemented by the following:

Furnish sign hardware for fiberglass signs in accordance with the fiberglass substrate manufacturer's recommendations.

Article 636.3. Construction, Section A. Fabrication, Part 1. Sign Blanks. The first paragraph is voided and replaced by the following:

Furnish sign blanks to the sizes and shapes shown on the plans and that are free of buckles, warps, burrs, dents, cockles, or other defects. Do not splice individual extruded aluminum or fiberglass panels.

Article 636.3. Construction, Section A. Fabrication, Part 2. Sheeting Application is voided and replaced by the following:

2. Sheeting Application. Apply sheeting to sign blanks in conformance with the sheeting manufacturer's recommended procedures. Meet the fabrication requirements of DMS-8300, Section 8300.7.F, "Sign Fabrication" for white, orientation non-compliant sheeting listed on the Department's Material Producer List entitled "Sign Face Materials." Clean and prepare the outside surface of extruded aluminum or fiberglass flanges in the same manner as the sign panel face.

Minimize the number of splices in the sheeting. Overlap the lap-splices by at least 1/4 in. Use butt splices for Type C microprismatic, Type D, and Type E reflective sheeting. Provide a 1-ft. minimum dimension for any piece of sheeting. Do not splice sheeting for signs fabricated with transparent screen inks or colored transparent films.

Article 636.3. Construction, Section A. Fabrication, Part 3. Sign Assembly. The first paragraph is voided and replaced by the following:

3. Sign Assembly. Assemble extruded aluminum signs in accordance with the details shown on the plans. Assemble fiberglass signs in accordance with the fiberglass manufacturer's recommendations located on the Department's Material Producer List entitled "Fiberglass Sign Substrates." Sign face surface variation must not exceed 1/8 in. per foot. Surface misalignment between panels in multi-panel signs must not exceed 1/16 in. at any point.

Article 636.3. Construction, Section B. Storage and Handling. The last paragraph is voided and replaced by the following:

Store all finished signs off the ground and in a vertical position until erected. Store finished sheet-aluminum substrate signs in a weatherproof building. Extruded aluminum and fiberglass substrate signs may be stored outside.

Article 636.3. Construction, Section E. Replacement is supplemented by the following:

Mounting hardware for fiberglass signs will be per the fiberglass substrate manufacturer's recommendations.

Article 636.3. Construction, Section H. Documentation is added.

H. Documentation. Provide a notarized original of the Signing Material Statement (Form 2273) with the proper attachments for verification of compliance.

Article 636.5. 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 for at the unit price bid for "Aluminum Signs," "Fiberglass Signs," "Signs," "Replacing Existing Aluminum Signs," "Replacing Existing Fiberglass Signs," "Refurbishing Aluminum Signs," or "Refurbishing Fiberglass Signs," of the type specified.

Article 636.5. Payment, Section B. Replacement is voided and replaced by the following:

B. Replacement. This price is full compensation for: furnishing and installing new aluminum or fiberglass signs and hardware; removal of existing signs; fabrication of sign panels; treatment of sign panels required before application of the background materials; application of the background materials and messages to the sign panels; furnishing and fabricating frames, wind beams, stiffeners, or required joint backing strips; furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections; assembling and erecting the signs; preparing and cleaning the signs; salvaging and disposing of unsalvageable material; and equipment, materials, labor, tools, and incidentals.

SPECIAL PROVISION

672---034

Raised Pavement Markers

For this project, Item 672, "Raised Pavement Markers," 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 672.2. Materials, Section B. Adhesives is supplemented by the following:

- The Contractor may propose alternate adhesive materials for consideration and approval by the Engineer.

Article 672.3. Construction. The sixth paragraph is voided and replaced by the following:

Use the following adhesive materials for placement jiggle bar tile, reflectorized pavement markers, and traffic buttons unless otherwise shown on the plans:

- standard or flexible bituminous adhesive for applications on bituminous pavements.
- epoxy adhesive or flexible bituminous adhesive for applications on hydraulic cement concrete pavements.

Use epoxy adhesive for plowable reflectorized pavement markers.

Article 672.3. Construction is supplemented by the following:

Provide a 30-day performance period that begins the day following 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. This written acceptance does not constitute final acceptance.

Replace all missing, broken or non-reflective RPMs. Visual evaluations will be used for these determinations. Upon request, the Engineer will allow a Contractor representative to accompany the Engineer on these evaluations.

The Engineer may exclude RPMs from the replacement provisions of the performance, provided the Engineer determines that the failure is a result of causes other than defective material or inadequate installation procedures. Examples of outside causes are extreme wear at intersections, damage by snow or ice removal, and pavement failure.

Replace all missing or non-reflective RPMs identified during the performance period within 30 days after notification. The end of the performance period does not relieve the Contractor from the performance deficiencies requiring corrective action identified during the performance period.

Article 672.5. Payment is supplemented by the following:

No additional payment will be made for replacement of RPMs failing to meet the performance requirements.

**SPECIAL PROVISION
TO
SPECIAL SPECIFICATION
1122--001**

Temporary Erosion, Sedimentation, and Environmental Controls

For this project, Special Specification Item 1122, “Temporary Erosion, Sedimentation, and Environmental Controls” 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 3.C. Training is supplemented by the following:

The Environmental Management System (EMS) eLearning Courses and Department’s EMS Policy Statement can be found at http://txdot.gov/business/ems_courses.htm. The following training has been developed in compliance with the Department’s EMS program.

All Contractor and subcontractor employee’s involved in the earthwork activities, small or large structures, storm water control measures, and seeding activities must complete the following training located at to <https://www.txdot.gov/inside-txdot/division/environmental/programs/ems-courses.html>. Training is provided by the Department at no cost to the Contractor and is valid for 3 years from the date of completion. The Engineer may require training at a frequency less than 3 years based on environmental needs.

- “Environmental Management System: Awareness Training for the Contractor (English and Spanish) (Approximate running time 20 minutes),” and
- “Storm Water: Environmental Requirements During Construction (English and Spanish) (Approximate running time 20 minutes).”

The CRPe, alternate CRPe designated for emergencies, Contractor’s superintendent, and Contractor and subcontractor lead personnel involved in SWP3 activities must enroll and complete the training located at <http://www.dedtraining.com/>. Training is provided by a third party and is valid for 3 years from the date shown on the Certificate of Completion. Coordinate enrollment through the third party and pay associated fees for the following training:

- “Revegetation During Construction,”
- “Construction General Permit Compliance,” and
- “Construction Stage Gate Checklist (CSGC).”

Training and associated fees will not be measured or paid for directly but are considered subsidiary to this Item.

**SPECIAL PROVISION
TO
SPECIAL SPECIFICATION
6834--002
Portable Changeable Message Sign**

For this project, Special Specification Item 6834, “Portable Changeable Message Sign,” 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 2. Materials, Section A. Minimum Luminance Requirements, is voided and not replaced.

Article 2. Materials, Section C. Changeable Message Sign. The second paragraph is voided and replaced by the following:

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 x 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.

SPECIAL SPECIFICATION

1122

Temporary Erosion, Sedimentation, and Environmental Controls

- 1. Description.** Install, maintain, and remove erosion, sedimentation, and environmental control measures to prevent or reduce the discharge of pollutants in accordance with the Storm Water Pollution Prevention Plan (SWP3) as provided in the plans and the Texas Pollutant Discharge Elimination System (TPDES) General Permit TXR150000. Control measures are defined as Best Management Practices used to prevent or reduce the discharge of pollutants. Control measures include but are not limited to rock filter dams, temporary pipe slope drains, temporary paved flumes, construction exits, earthwork for erosion control, pipe, construction perimeter fence, sandbags, temporary sediment control fence, biodegradable erosion control logs, vertical tracking, temporary or permanent seeding, and other measures. Perform work in a manner to prevent degradation of receiving waters, facilitate project construction, and comply with applicable federal, state, and local regulations. Ensure the installation and maintenance of control measures is performed in accordance with the manufacturer's or designer's specifications.

By signing the Contractor Certification of Compliance, the Contractor certifies they have read and understand the requirements applicable to this project pertaining to the SWP3, the plans, and the TPDES General Permit TXR150000. The Contractor is responsible for any penalties associated with non-performance of installation or maintenance activities required for compliance. Provide the Contractor Certification of Compliance to the Engineer prior to performing earthwork operations. The most current version of the Contractor Certification of Compliance can be found at:

<http://www.txdot.gov/inside-txdot/division/environmental/ems-courses.html>.

A sample of the language has been attached to this specification. Ensure the most current version of the certificate is executed for this project.

- 2. Materials.** Furnish materials in accordance with the following:

- Item 161, "Compost"
- Item 432, "Riprap"
- Item 556, "Pipe Underdrains"

A. Rock Filter Dams.

- 1. Aggregate.** Furnish aggregate with hardness, durability, cleanliness, and resistance to crumbling, flaking, and eroding acceptable to the Engineer. Provide the following:
 - **Types 1, 2, and 4 Rock Filter Dams.** Use 3 to 6 in. aggregate.
 - **Type 3 Rock Filter Dams.** Use 4 to 8 in. aggregate.
- 2. Wire.** Provide minimum 20 gauge galvanized wire for the steel wire mesh and tie wires for Types 2 and 3 rock filter dams. Type 4 dams require:

- A double-twisted, hexagonal weave with a nominal mesh opening of 2-1/2 in. x 3-1/4 in.;
- Minimum 0.0866 in. steel wire for netting;
- Minimum 0.1063 in. steel wire for selvages and corners; and minimum 0.0866 in. for binding or tie wire.

3. Sandbag Material. Furnish sandbags meeting “Sandbags for Erosion Control,” except that any gradation of aggregate may be used to fill the sandbags.

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

Furnish concrete in accordance with Item 432, “Riprap.”

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

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

1. Rock Construction Exit. Provide crushed aggregate for long and short-term construction exits. Furnish aggregates that are clean, hard, durable, and free from adherent coatings such as salt, alkali, dirt, clay, loam, shale, soft or flaky materials and organic and injurious matter. Use 4- to 8-in. aggregate for Type 1 and 2- to 4-in. aggregate for Type 3.

2. Timber Construction Exit. Furnish No. 2 quality or better railroad ties and timbers for long-term construction exits, free of large and loose knots and treated to control rot. Fasten timbers with nuts and bolts or lag bolts, of at least 1/2 in. diameter, unless otherwise shown on the plans or allowed. For short-term exits, provide plywood or pressed wafer board at least 1/2 in. thick.

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

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

F. Pipe. Provide pipe outlet material in accordance with Item 556, “Pipe Underdrains,” and details shown on the plans.

G. Construction Perimeter Fence.

1. **Posts.** Provide essentially straight wood or steel posts that are at least 60 in. long. Furnish soft wood posts with a minimum diameter of 3 in. or use 2 x 4 boards. Furnish hardwood posts with a minimum cross-section of 1-1/2 x 1-1/5 in. Furnish T- or L-shaped steel posts with a minimum weight of 1.3 lb. per foot.
2. **Fence.** Provide orange construction fencing as approved by the Engineer.
3. **Fence Wire.** Provide 12-1/2 gauge or larger galvanized smooth or twisted wire. Provide 16 gauge or larger tie wire.
4. **Flagging.** Provide brightly-colored flagging that is fade-resistant and at least 3/4 in. wide to provide maximum visibility both day and night.
5. **Staples.** Provide staples with a crown at least 1/2 in. wide and legs at least 1/2 in. long.
6. **Used Materials.** Previously used materials meeting the applicable requirements may be used if accepted by the Engineer.

H. Sandbags. Provide sandbag material of polypropylene, polyethylene, or polyamide woven fabric with a minimum unit weight of 4 oz. per square yard, a Mullen burst-strength exceeding 300 psi, and an ultraviolet stability exceeding 70%.

Use natural coarse sand or manufactured sand meeting the gradation given in Table 1 to fill sandbags. Filled sandbags must be 24 to 30 in. long, 16 to 18 in. wide, and 6 to 8 in. thick.

**Table 1
Sand Gradation**

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

Aggregate may be used in lieu of sand for situations where sandbags are not adjacent to traffic. The aggregate size shall not exceed 3/8 in.

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

1. **Fabric.** Provide fabric materials in accordance with DMS-6230, "Temporary Sediment Control Fence Fabric."
2. **Posts.** Provide essentially straight wood or steel posts with a minimum length of 48 in., unless otherwise shown on the plans. Soft wood posts must be at least 3 in. in diameter or nominal 2 x 4in. Hardwood posts must have a minimum cross-section of 1-1/2 x 1-1/2 in. T- or L-shaped steel posts must have a minimum weight of 1.3 lb. per foot.

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

J. Biodegradable Erosion Control Logs.

1. **Core Material.** Furnish core material that is biodegradable or recyclable. Except where specifically called out in plans, material may be compost, mulch, aspen excelsior wood fibers, chipped site vegetation, agricultural rice or wheat straw, coconut fiber, 100% recyclable fibers, or any other acceptable material. No more than 5% of the material is permitted to escape from the containment mesh. Furnish compost meeting the requirements of Item 161, "Compost."
2. **Containment Mesh.** Furnish containment mesh that is 100% biodegradable, photodegradable or recyclable such as burlap, twine, UV photodegradable plastic, polyester, or any other acceptable material.
 - a. Furnish biodegradable or photodegradable containment mesh when log will remain in place as part of a vegetative system.
 - b. Furnish recyclable containment mesh for temporary installations.
3. **Size.** Furnish biodegradable erosion control logs with diameters shown on the plans or as directed. Stuff containment mesh densely so logs do not deform.

3. Qualifications, Training, and Employee Requirements.

- A. Contractor Responsible Person Environmental (CRPe) Qualifications and Responsibilities.** Provide and designate in writing at the preconstruction conference a CRPe who has overall responsibility for the storm water management program. The CRPe will identify and implement storm water and erosion control practices; will oversee and observe storm water control measure monitoring and management; will monitor the project site daily to ensure compliance with the SWP3 and TPDES General Permit TXR150000; and will document daily monitoring reports and provide the reports to the Department within 48 hours. The CRPe will provide recommendations to the Engineer on how to improve the effectiveness of control measures. Attend the Department's preconstruction conference for the project. Administer the training identified in Article 3.C. *Training*. Document and submit a list to the Engineer of employees who have completed the training. The list should include the employee's name, the training course name, and date the employee completed the training. Provide the most current list to the Engineer at the preconstruction conference or prior to earth disturbing activities. Maintain the list as needed and make available for inspection.

- B. Contractor Superintendent Qualifications and Responsibilities.** Provide a superintendent that is competent and has experience with and knowledge of storm water management and is knowledgeable of the requirements and the conditions of the TPDES General Permit TXR150000. The superintendent is responsible for managing and overseeing the day to day operations and activities at the project site; working with the CRPe to provide effective storm water management at the project site; representing and acting on-behalf of the Contractor; and attending the Department's preconstruction conference for the project.
- C. Training.** All Contractor and subcontractor employees directly involved in the earthwork activities, small or large structures, storm water control measures, and seeding activities are required to complete the training identified by the Department prior to working in the right of way. Training may take place at a location at the discretion of the Contractor.
- 4. Construction.**
- A. Contractor Responsibilities.** Implement the SWP3 for the project site in accordance with in accordance with the plans and specifications, TPDES General Permit TXR150000, and as directed by the Engineer. Coordinate storm water management with all other work on the project. Develop and implement an SWP3 for project-specific material supply plants within and outside of the Department's right of way in accordance with the specific or general storm water permit requirements. Prevent water pollution from storm water associated with construction activity from entering any surface water or private property on or adjacent to the project site.
- B. Implementation.** The CRPe, or an alternate, must be accessible by phone and able to respond to storm water management emergencies 24 hours per day.
- 1. Commencement.** Implement the SWP3 as shown and as directed. Contractor proposed recommendations for changes will be allowed as approved. Conform to the established guidelines in the TPDES General Permit TXR150000 to make changes. Do not implement changes until approval has been received and changes have been incorporated into the plans by the Engineer. Minor adjustments to meet field conditions are allowed and will be recorded by the Engineer in the SWP3.
- 2. Phasing.** Implement control measures prior to the commencement of activities that result in soil disturbance. Phase and minimize the soil disturbance to the areas shown on the plans. Coordinate temporary control measures with permanent control measures and all other work activities on the project to assure economical, effective, safe, continuous water pollution prevention. Provide control measures that are appropriate to the construction means, methods, and sequencing allowed by the Contract. Exercise precaution throughout the life of the project to prevent pollution of ground waters and surface waters. Schedule and perform clearing and grubbing operations so that stabilization measures will follow immediately thereafter if project conditions permit. Bring all grading sections to final grade as soon as possible and implement temporary and permanent control measures at the earliest time possible. Implement temporary control measures when required by the TPDES General Permit TXR150000 or otherwise necessitated by project conditions.

Do not prolong final grading and shaping. Preserve vegetation where possible throughout the project and minimize clearing, grubbing, and excavation within stream banks, bed, and approach sections.

C. General.

1. **Temporary Alterations or Control Measure Removal.** Altering or removal of control measures is allowed when control measures are restored within the same working day.
 2. **Stabilization.** Initiate stabilization for disturbed areas no more than 14 days after the construction activities in that portion of the site has temporarily or permanently ceased. Establish a uniform vegetative cover or utilize another stabilization practice in accordance with the TPDES General Permit TXR150000.
 3. **Finished Work.** Upon the Engineer's acceptance of vegetative cover or other stabilization practice, remove and dispose of all temporary control measures unless otherwise directed. Complete soil disturbing activities and establish a uniform perennial vegetative cover. A project will not be considered for acceptance until a vegetative cover of 70% density of existing adjacent undisturbed areas is obtained or equivalent permanent stabilization is obtained in accordance with the TPDES General Permit TXR150000. An exception will be allowed in arid areas as defined in the TPDES General Permit TXR150000.
 4. **Restricted Activities and Required Precautions.** Do not discharge onto the ground or surface waters any pollutants such as chemicals, raw sewage, fuels, lubricants, coolants, hydraulic fluids, bitumens, or any other petroleum product. Operate and maintain equipment on site in a manner as to prevent actual or potential water pollution. Manage, control, and dispose of litter on site such that no adverse impacts to water quality occur. Prevent dust from creating a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property. Wash out concrete trucks only as described in the TPDES General Permit TXR150000. Utilize appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water (i.e. dewatering). Prevent discharges that would contribute to a violation of Edwards Aquifer Rules, water quality standards, the impairment of a listed water body, or other state or federal law.
- D. Installation, Maintenance, and Removal Work.** Perform work in accordance with the SWP3, according to manufacturers' guidelines, and in accordance with the TPDES General Permit TXR150000. Install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until earthwork construction and permanent erosion control features are in place or the disturbed area has been adequately stabilized as determined by the Engineer.

The Department will inspect and document the condition of the control measures at the frequency shown on the plans and will provide the Construction SWP3 Field Inspection and Maintenance Reports to the Contractor. Make corrections as soon as possible before the next anticipated rain event or within 7 calendar days after being able to enter the work site for each control measure.

The only acceptable reason for not accomplishing the corrections with the time frame specified is when site conditions are "Too Wet to Work". If a correction is deemed critical by the Engineer, immediate action is required. When corrections are not made within the established time frame, all work will cease on the project and time charges will continue while the control measures are brought into compliance. Once the Engineer reviews and documents the project is in compliance, work may commence. Commencing work does not release the contractor of the liability for noncompliance of the SWP3, plans, or TPDES General Permit TXR150000.

The Engineer may limit the disturbed area if in the opinion of the Engineer the Contractor cannot control soil erosion and sedimentation resulting from the Contractor's operations. Implement additional controls as directed.

Remove devices upon approval or as directed. Upon removal, finish-grade and dress the area. Stabilize disturbed areas in accordance with the permit, and as shown on the plans or directed. The Contractor retains ownership of stockpiled material and must remove it from the project when new installations or replacements are no longer required.

1. **Rock Filter Dams for Erosion Control.** Remove trees, brush, stumps, and other objectionable material that may interfere with the construction of rock filter dams. Place sandbags as a foundation when required or at the Contractor's option.

For Types 1, 2, 3, and 5, place the aggregate to the lines, height, and slopes specified, without undue voids. For Types 2 and 3, place the aggregate on the mesh and then fold the mesh at the upstream side over the aggregate and secure it to itself on the downstream side with wire ties, or hog rings, or as directed. Place rock filter dams perpendicular to the flow of the stream or channel unless otherwise directed. Construct filter dams according to the following criteria, unless otherwise shown on the plans:

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

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

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

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

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

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

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

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

c. Type 3 (Reinforced).

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

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

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

d. Type 4 (Sack Gabions). Unfold sack gabions and smooth out kinks and bends. For vertical filling, connect the sides by lacing in a single loop–double loop pattern on 4- to 5-in. spacing. At one end, pull the end lacing rod until tight, wrap around the end, and twist 4 times. At the filling end, fill with stone, pull the rod tight, cut the wire with approximately 6 in. remaining, and twist wires 4 times.

For horizontal filling, place sack flat in a filling trough, fill with stone, and connect sides and secure ends as described above.

Lift and place without damaging the gabion. Shape sack gabions to existing contours.

e. Type 5. Provide rock filter dams as shown on the plans.

- 2. Temporary Pipe Slope Drains.** Install pipe with a slope as shown on the plans or as directed. Construct embankment for the drainage system in 8-in. lifts to the required elevations. Hand-tamp the soil around and under the entrance section to the top of the embankment as shown on the plans or as directed. Form the top of the embankment or earth dike over the pipe slope drain at least 1 ft. higher than the top of the inlet pipe at all points. Secure the pipe with hold-downs or hold-down grommets spaced a maximum of 10 ft. on center. Construct the energy dissipaters or sediment traps as shown on the plans or as directed. Construct the sediment trap using concrete or rubble riprap in accordance with Item 432, "Riprap," when designated on the plans.
- 3. Temporary Paved Flumes.** Construct paved flumes as shown on the plans or as directed. Provide excavation and embankment (including compaction of the subgrade) of material to the dimensions shown on the plans, unless otherwise indicated. Install a rock or rubble riprap energy dissipater, constructed from the materials specified above to a minimum depth of 9 in. at the flume outlet to the limits shown on the plans or as directed.
- 4. Construction Exits.** When tracking conditions exist, prevent traffic from crossing or exiting the construction site or moving directly onto a public roadway, alley, sidewalk, parking area, or other right of way areas other than at the location of construction exits. Construct exits for either long or short-term use.
 - a. Long-Term.** Place the exit over a foundation course, if necessary. Grade the foundation course or compacted subgrade to direct runoff from the construction exits to a sediment trap as shown on the plans or as directed. Construct exits with a

width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed.

(1) Type 1. Construct to a depth of at least 8 in. using crushed aggregate as shown on the plans or as directed.

(2) Type 2. Construct using railroad ties and timbers as shown on the plans or as directed.

b. Short-Term.

(1) Type 3. Construct using crushed aggregate, plywood, or wafer board. This type of exit may be used for daily operations where long-term exits are not practical.

(2) Type 4. Construct as shown on the plans or as directed.

5. Earthwork for Erosion Control. Perform excavation and embankment operations to minimize erosion and to remove collected sediments from other erosion control devices.

a. Excavation and Embankment for Erosion Control Features. Place earth dikes, swales, or combinations of both along the low crown of daily lift placement, or as directed, to prevent runoff spillover. Place swales and dikes at other locations as shown on the plans or as directed to prevent runoff spillover or to divert runoff. Construct cuts with the low end blocked with undisturbed earth to prevent erosion of hillsides. Construct sediment traps at drainage structures in conjunction with other erosion control measures as shown on the plans or as directed.

Where required, create a sediment basin providing 3,600 cu. ft. of storage per acre drained, or equivalent control measures for drainage locations that serve an area with 10 or more disturbed acres at one time, not including offsite areas.

b. Excavation of Sediment and Debris. Remove sediment and debris when accumulation affects the performance of the devices, after a rain, and when directed.

6. Construction Perimeter Fence. Construct, align, and locate fencing as shown on the plans or as directed.

a. Installation of Posts. Embed posts 18 in. deep or adequately anchor in rock, with a spacing of 8 to 10 ft.

b. Wire Attachment. Attach the top wire to the posts at least 3 ft. from the ground. Attach the lower wire midway between the ground and the top wire.

c. Flag Attachment. Attach flagging to both wire strands midway between each post. Use flagging at least 18 in. long. Tie flagging to the wire using a square knot.

7. Sandbags for Erosion Control. Construct a berm or dam of sandbags that will intercept sediment-laden storm water runoff from disturbed areas, create a retention pond, detain

sediment, and release water in sheet flow. Fill each bag with sand so that at least the top 6 in. of the bag is unfilled to allow for proper tying of the open end. Place the sandbags with their tied ends in the same direction. Offset subsequent rows of sandbags 1/2 the length of the preceding row. Place a single layer of sandbags downstream as a secondary debris trap. Place additional sandbags as necessary or as directed for supplementary support to berms or dams of sandbags or earth.

- 8. Temporary Sediment-Control Fence.** Provide temporary sediment-control fence near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the fence into erosion-control measures used to control sediment in areas of higher flow. Install the fence as shown on the plans, as specified in this Section, or as directed.
 - a. Installation of Posts.** Embed posts at least 18 in. deep, or adequately anchor, if in rock, with a spacing of 6 to 8 ft. and install on a slight angle toward the run-off source.
 - b. Fabric Anchoring.** Dig trenches along the uphill side of the fence to anchor 6 to 8 in. of fabric. Provide a minimum trench cross-section of 6 x 6 in. Place the fabric against the side of the trench and align approximately 2 in of fabric along the bottom in the upstream direction. Backfill the trench, then hand-tamp.
 - c. Fabric and Net Reinforcement Attachment.** Unless otherwise shown under the plans, attach the reinforcement to wooden posts with staples, or to steel posts with T-clips, in at least 4 places equally spaced. Sewn vertical pockets may be used to attach reinforcement to end posts. Fasten the fabric to the top strand of reinforcement by hog rings or cord every 15 in. or less.
 - d. Fabric and Net Splices.** Locate splices at a fence post with a minimum lap of 6 in. attached in at least 6 places equally spaced, unless otherwise shown under the plans. Do not locate splices in concentrated flow areas.

Requirements for installation of used temporary sediment-control fence include the following:

- fabric with minimal or no visible signs of biodegradation (weak fibers),
- fabric without excessive patching (more than 1 patch every 15 to 20 ft.),
- posts without bends, and
- backing without holes.

- 9. Biodegradable Erosion Control Logs.** Install biodegradable erosion control logs near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the biodegradable erosion control logs into the erosion measures used to control sediment in areas of higher flow. Install, align and locate the biodegradable erosion control logs as specified below, as shown in plans or as directed.

Secure biodegradable erosion control logs in a method adequate to prevent displacement as a result of normal rain events, prevent damage to the logs, and to the satisfaction of the Engineer such that flow is not allowed under the logs. Temporarily removing and replacing biodegradable erosion logs as to facilitate daily work is allowed at the Contractor's expense.

10. Vertical Tracking. Perform vertical tracking on slopes to temporarily stabilize soil. Provide equipment with a track undercarriage capable of producing a linear soil impression measuring a minimum of 12 inches in length by 2 to 4 inches in width by 1/2 to 2 inches in depth. Do not exceed 12 inches between track impressions. Install continuous linear track impressions where the 12 inch length impressions are perpendicular to the slope.

E. Monitoring and Documentation. Monitor the control measures on a daily basis. Monitoring will consist of, but is not limited to, observing, inspecting, and documenting site locations with control measures and discharge points to provide maintenance and inspection of controls as described in the SWP3. Keep written records of daily monitoring. Document in the daily monitoring report the control measure condition, the date of inspection, required corrective actions, responsible person for making the corrections, and the date corrective actions were completed. Maintain records of all monitoring reports at the project site or at a place approved by the Engineer. Provide copies to the Engineer. Together, the CRPe and an Engineer's representative will complete the Construction Stage Gate Checklist on a periodic basis as determined by the Engineer.

5. Measurement.

A. Rock Filter Dams. Installation or removal of rock filter dams will be measured by the foot or by the cubic yard. The measured volume will include sandbags, when used.

1. Linear Measurement. When rock filter dams are measured by the foot, measurement will be along the centerline of the top of the dam.

2. Volume Measurement. When rock filter dams are measured by the cubic yard, measurement will be based on the volume of rock computed by the method of average end areas.

a. Installation. Measurement will be made in final position.

b. Removal. Measurement will be made at the point of removal.

B. Temporary Pipe Slope Drains. Temporary pipe slope drains will be measured by the foot.

C. Temporary Paved Flumes. Temporary paved flumes will be measured by the square yard of surface area. The measured area will include the energy dissipater at the flume outlet.

D. Construction Exits. Construction exits will be measured by the square yard of surface area.

E. Earthwork for Erosion and Sediment Control.

1. Equipment and Labor Measurement. Equipment and labor used will be measured by the actual number of hours the equipment is operated and the labor is engaged in the work.

2. Volume Measurement.

a. In Place.

(1) Excavation. Excavation will be measured by the cubic yard in its original position and the volume computed by the method of average end areas.

(2) Embankment. Embankment will be measured by the cubic yard in its final position by the method of average end areas. The volume of embankment will be determined between:

- the original ground surfaces or the surface upon that the embankment is to be constructed for the feature and
- the lines, grades and slopes of the accepted embankment for the feature.

b. In Vehicles. Excavation and embankment quantities will be combined and paid for under “Earthwork (Erosion and Sediment Control, In Vehicle).” Excavation will be measured by the cubic yard in vehicles at the point of removal. Embankment will be measured by the cubic yard in vehicles measured at the point of delivery. Shrinkage or swelling factors will not be considered in determining the calculated quantities.

F. Construction Perimeter Fence. Construction perimeter fence will be measured by the foot.

G. Sandbags for Erosion Control. Sandbags will be measured as each sandbag or by the foot along the top of sandbag berms or dams.

H. Temporary Sediment-Control Fence. Installation or removal of temporary sediment-control fence will be measured by the foot.

I. Biodegradable Erosion Control Logs. Installation or removal of biodegradable erosion control logs will be measured by the linear foot along the centerline of the top of the control logs.

J. Vertical Tracking. Vertical tracking will not be measured or paid for directly but is considered subsidiary to this Item.

6. Payment. The following will not be paid for directly but are subsidiary to pertinent Items:

- erosion-control measures for Contractor project-specific locations (PSLs) inside and outside the right of way (such as construction and haul roads, field offices, equipment and supply areas, plants, and material sources);

- removal of litter; unless a separate pay item is shown in the plans.
- repair to devices and features damaged by Contractor operations;
- added measures and maintenance needed due to negligence, carelessness, lack of maintenance, and failure to install permanent controls;
- removal and reinstallation of devices and features needed for the convenience of the Contractor;
- finish grading and dressing upon removal of the device; and
- minor adjustments including but not limited to plumbing posts, reattaching fabric, minor grading to maintain slopes on an erosion embankment feature, or moving small numbers of sandbags.

Stabilization of disturbed areas will be paid for under pertinent Items.

Furnishing and installing pipe for outfalls associated with sediment traps and ponds will not be paid for directly but is subsidiary to the excavation and embankment under this Item.

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

- 1. Installation.** Installation will be paid for as “Rock Filter Dams (Install)” of the type specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.
- 2. Removal.** Removal will be paid for as “Rock Filter Dams (Remove).” This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

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

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

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

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

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

- C. Temporary Paved Flumes.** The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Temporary Paved Flume (Install)” or “Temporary Paved Flume (Remove).” This price is full compensation for furnishing and placing materials, removal and disposal, equipment, labor, tools, and incidentals.

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

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

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

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

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

Construction of sediment traps used in conjunction with the construction exit will be measured and paid for under “Earthwork for Erosion and Sediment Control.”

- E. Earthwork for Erosion and Sediment Control.**

- 1. Initial Earthwork for Erosion and Sediment Control.** The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Excavation (Erosion and Sediment Control, In Place)”, “Embankment (Erosion and Sediment Control, In Place)”, “Excavation (Erosion and Sediment Control, In Vehicle)”, “Embankment (Erosion and

Sediment Control, In Vehicle)”, or “Earthwork (Erosion and Sediment Control, In Vehicle)”.

This price is full compensation for excavation and embankment including hauling, disposal of material not used elsewhere on the project; embankments including furnishing material from approved sources and construction of erosion-control features; equipment, labor; tools, and incidentals.

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

- 2. Maintenance Earthwork for Erosion and Sediment Control for Cleaning and/or Restoring Control Measures.** The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for by a Contractor Force Account Item.

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

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

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

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

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

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

Removal of sandbags will not be paid for directly but is subsidiary to the installation Item. When the Engineer directs that the sandbag installation or portions thereof be replaced,

payment will be made at the unit price bid for “Sandbags for Erosion Control,” which is full compensation for the reinstallation of the sandbags.

H. Temporary Sediment-Control Fence. The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid as follows:

- 1. Installation.** Installation will be paid for as “Temporary Sediment-Control Fence (Install).” This price is full compensation for furnishing and operating equipment finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.
- 2. Removal.** Removal will be paid for as “Temporary Sediment-Control Fence (Remove).” This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

I. Biodegradable Erosion Control Logs. The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid as follows:

- 1. Installation.** Installation will be paid for as “Biodegradable Erosion Control Logs (Install)” of the size specified. This price is full compensation for furnishing and operating equipment finish backfill and grading, staking, proper disposal, labor, materials, tools, and incidentals.
- 2. Removal.** Removal will be paid for as “Biodegradable Erosion Control Logs (Remove).” This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

J. Vertical Tracking. Vertical tracking will not be measured or paid for directly but is considered subsidiary to this Item.

CONTRACTOR CERTIFICATION OF COMPLIANCE
WITH STORM WATER REQUIREMENTS

I, _____ certify that I am the duly appointed representative of the Contractor with authority to make this Contractor certification. I have read and understand the requirements applicable to this project pertaining to storm water discharge authorization under Texas Pollutant Discharge Elimination System (TPDES) General Permit (GP) TXR150000. The Contractor agrees to comply with the terms of the permit that are expressly stated in the contract documents as being the responsibility of the Contractor. I have read and understand the Storm Water Pollution Prevention Plan (SWP3) developed by the Department for this project. The Contractor agrees it will be implemented prior to construction according to permit requirements and the contract documents. I understand that failure to comply with the terms of the permit that are expressly stated in the contract documents, plans, and specifications as being the responsibility of the Contractor may result in civil penalties.

The Contractor acknowledges its responsibility to satisfy the following requirements:

- Implement the SWP3 for the project in accordance with the plans and specifications and the TPDES GP TXR150000.
- Install and maintain control measures on the project in accordance with the manufacturer's or designer's specifications.
- Collaborate with the Department for joint monitoring of best management practices (BMPs) on a regular basis to verify that BMPs are performing as intended in accordance with the plans and specifications and with TPDES GP TXR150000.
- Collaborate with the Department for joint identification of BMP maintenance needs and carry out such maintenance in accordance with the plans and specifications, TPDES GP TXR150000 and as directed by the Engineer.
- Repair the integrity of any BMP as directed by the Engineer as soon as reasonably possible.
- If appropriate, recommend changes needed in the SWP3 to the Engineer in order to prevent, to the extent practicable, water pollution associated with construction activities from entering any surface water or private property on or adjacent to the project site by storm water discharges.
- Stabilize disturbed areas, as soon as practicable, in accordance with the TPDES GP TXR150000 and as directed by the Engineer.
- If applicable, obtain appropriate authorizations for activities associated with any Project Specific Location under the authority of the Contractor and provide appropriate documentation of compliance to the Engineer.
- Satisfy any other responsibility indicated in the contract documents that are expressly stated as the responsibility of the Contractor.

Signature and Title: _____

Date: _____

FORT BEND COUNTY TOLL ROAD AUTHORITY
SPECIAL SPECIFICATION 1310
CPM Schedules

1. The Contractor shall provide a written statement to the Engineer prior to the preconstruction conference describing his scheduling capabilities for the Engineer to review. This statement shall include the following as a minimum:
 - 1.1. Identification, qualifications, and experience of the member(s) of the Contractor's scheduling staff or the staff of any scheduling consultant retained by the Contractor. Person responsible for preparing schedules must be approved by the Engineer prior to initial schedule submittal.
 - 1.2. References of not less than two (2) previous projects on which the Contractor, or the Contractor's scheduling consultant, has utilized Critical Path Method (CPM) scheduling, which were of not less than one-half the value of the Contract contemplated. Engineer references shall be included.
 - 1.3. The scheduling software to be utilized on this project is Primavera Project Planner P3 version 3.1 or later. Schedules may not be prepared using SureTrak or Primavera E or EC on this project.
2. The Engineer will schedule and conduct a preconstruction conference a portion of which will specifically address the development and maintenance of the CPM schedule.
 - 2.1. The Contractor shall be prepared to review and discuss the schedule and sequence of operations plus resource and cost loading. The conference shall be attended by:
 - 2.1.1. Contractor's project management and scheduling staff
 - 2.1.2. Significant subcontractors or suppliers representatives whom the Contractor may desire to invite or whom the Engineer may request. .
 - 2.2. The Contractor shall submit to the Engineer a copy of the construction schedule that was used in the preparation of the bid.
3. Contractor acknowledges that it is constructing a revenue generating and revenue financed project. As such, it is expressly understood and agreed that the time of beginning, the rate of progress, and the time of completion of the work are of the essence of this contract. The work shall be prosecuted at such time, in such manner, and on such part or parts of the project as may be required to complete the project as contemplated in the Contract Documents to achieve the completion date and milestones as agreed upon in the Contract.
4. The Contractor shall prepare and submit to the Engineer the initial project schedule within twenty-one (21) days after contract award. The project schedule produced and submitted shall be in the form of a Critical Path Method (CPM) network diagram. Sufficient detail describing the sequence of activities required for complete performance of the all work; the early start and early finish dates of all activities; and an uninterrupted critical path from Notice to Proceed through Project Completion for the project shall be shown. A tabular report shall accompany the network diagram and shall, at a minimum, include an activity

number for each activity; the description and duration of each activity; all predecessors to and successors from each activity; and the early start, early finish, late start, late finish, and total float for each activity. The report shall support the network diagram. The initial project schedule shall also be submitted in electronic format via a disk containing a backup copy of the schedule.

5. The activities included in the contractor's schedule shall be in sufficient detail to assure that adequate planning has been done for proper execution of the work and such that the schedule provides an appropriate basis for monitoring and evaluating the progress of the work. A work activity is defined as an activity which requires time and resources (including manpower, equipment, and delivery of materials).
 - 5.1. Activity durations shall not be less than one (1) day nor more than fourteen (14) calendar days, unless otherwise approved by the Engineer. Activity durations shall be either:
 - 5.1.1. working days with each activity assigned to a calendar that has working and non-working days adjusted to reflect the actual seasonal weather in this area based upon historical weather records
 - 5.1.2. calendar days adjusted or factored to include an allowance for inclement weather based upon the actual seasonal weather in this area based upon historical weather records

The schedule may use multiple calendars as may be required to account for the impact or lack of impact weather may have on particular operations. The schedule must use one method or the other consistently. The use of working day method is encouraged.

- 5.2. Each activity in the schedule shall have at least one predecessor and one successor unless approved by the Engineer. All activities, except Notice to Proceed, will be required to have at least one predecessor tied to the "start" of the subject activity. All activities, except project completion, will be required to have at least one successor tied to the "finish" of the subject activity.
- 5.3. The schedule will have at least one chain of activities, linked by logic, that constitute a critical path from the current data date to the completion of the project. Critical Path is defined as activities on the longest path through the network. All schedule submittals must use the option: Critical Activities = Longest Path.
- 5.4. The Contractor shall not use Constraints of any type without prior approval of the Engineer.
- 5.5. Hammocks shall not be used without prior approval and permission of the Engineer.
- 5.6. As a minimum the Contractor shall apply the activity code structure provided by the Engineer to each activity in the schedule.

Required Activity Codes:

- CSeg = Construction Segment (A, B, C, or D)
- DSeg = Design Segment (1, 2, 3, 4, 5, 6, or 7)
- Resp = Responsible Party (Contractor, Engineer, Mike Stones Associates, Inc.)
- Phas = Construction Phase (Per the TCP specified in the plans)

Seq = Construction Sequence (Per the TCP specified in the plans)

- 5.7. Activity descriptions must be sufficiently descriptive or contain enough information that each activity can be differentiated from all others on the project without the use of activity coding. This can be done by including station numbers, lane descriptions, intersections, etc.
 - 5.8. If requested by the Engineer, the Contractor shall provide highly detailed, (hourly), short term schedules for specific crucial items or periods, (i.e., traffic changes, tie-ins, main lane closures, etc.).
 - 5.9. If requested by the Engineer, the Contractor shall resource load short-term schedules to demonstrate that sufficient resources are available and capable of meeting the specific requirements resulting from the need to provide said schedule.
6. Detailed network diagram: The Contractor will only be required to submit printed schedule charts or reports for the initial schedule review and approval process. There after only an electronic backup copy of the schedule submitted on a diskette accompanying the pay request will be required. The Engineer may allow backup copies to be transmitted via e-mail solely at his discretion.
- 6.1. The Contractor's schedule submittal shall include a time-scaled network diagram based upon the calendar the contractor anticipates using for the project inclusive of holidays and weather allowances. The network diagrams shall be Critical Path Method (CPM) precedence format and shall show the sequence, duration, and interdependence of activities required for complete performance of all items of work. A calendar shall be shown on all sheets along the entire sheet length. Each activity shall be plotted such that the beginning and completion dates of each activity can be determined graphically by comparison with the calendar scale. Each sheet shall include a title block.
 - 6.2. Sufficient care shall be exercised to produce legible and accurate network diagrams. The network diagrams shall be drawn legibly on 24x36, or 11x17 inch media or comparable computerized plot as requested by the Engineer.
 - 6.3. Contractor, Engineer, TxDOT responsibility shall be coded and annotated on the network diagrams. In addition, each activity of the network diagrams shall be labeled with a complete description, as well as the planned duration in work days.
 - 6.4. The Contractor's schedule shall also be presented in a bar chart format based upon work days.
7. The detailed network diagram shall be accompanied by reports, in tabular format, prepared, sorted, and sub-sorted, as follows:
- 7.1. All activities sorted by activity number and including predecessor and successor relationships, lag and lead time. Each listing shall show activity number, description, location, responsibility, total duration in working days, early start date,

late start date, early finish date, late finish date, total float, free float and status (whether critical or completed) for each activity in the network diagram.

- 7.2. All activities sorted by responsibility, sub-sorted by early start and total float. The activity responsibility listing shall segregate in separate sub-listings; the work activities for the Contractor, vendors, subcontractors, and the Engineer, and submittals to the Engineer of all major items of material and equipment.
 - 7.3. A sub-listing of materials and equipment sorted by equipment tag number. The sub-listing of materials and equipment shall include the following activities: preparation of shop drawings and submittals to the Engineer, review by the Engineer, fabrication and/or delivery of materials and/or equipment. All of these activities shall be interfaced with the earliest date that the material or equipment is to be installed on the project.
 - 7.4. The detailed network diagram shall also be accompanied by an electronic backup copy of the schedule on a 3 ½ diskette(s) or compact disc. This diskette or disc must be made utilizing the Primavera Backup Utility within the P3 program using the schedule compression option. The diskette or disc must be properly labeled and as a minimum contain the Contractors name, Contract or Segment number, and the data date of the schedule.
8. If the Contractor desires to make a change to the schedule he shall notify the Engineer, in advance of making such change, in writing stating the reason for the change. If the Engineer considers the change to be major, the Engineer may require the Contractor to revise and submit for acceptance, all of the affected portions of the network diagram clearly marked to indicate the proposed changes along with electronic versions of the original schedule and the proposed changes and analysis to show the effect on the entire project. The original network and the proposed revision and analysis shall be submitted to the Engineer within fifteen (15) days after the Engineer notifies the Contractor that the revision is considered major. A change will be considered major if the time estimated to be required for an activity or the sequence of activities is varied from the original plan to a degree that there is reasonable doubt that the contract completion or other contractual milestone date will be met or if the change impacts the work of other contractors involved in the project or follow on projects. Changes to activities having adequate float will generally be considered as minor changes, except that an accumulation of minor changes may be considered a major change when such changes affect the contract completion or other milestone dates.

The schedule shall clearly indicate the sequence and interdependency of work activities. It shall include, but not be limited to the following items, as appropriate to the contract.

- 8.1. Engineering activities, all Engineer review and approvals [allow twenty-one (21) calendar days for Engineer review],
- 8.2. Submittals, vendor design activities, vendor supplied information, drawings, engineering, etc.,
- 8.3. Mobilization and move-in,
- 8.4. Excavation, backfilling, grading, paving, underground utilities,
- 8.5. Preparation of approval packages by the Contractor, review by the Engineer, approval/decision milestones [allow twenty-one (21) days for Engineer review],
- 8.6. Concrete placement sequence, forming, placing, curing, etc., (note: curing must be on a seven days per week calendar)

- 8.7. Order, manufacture, shipment, delivery, installation, and check-out of major equipment,
 - 8.8. Order, manufacture, shipment, delivery, and installation of structural steel, misc. metals,
 - 8.9. Order, manufacture, shipment, delivery, and installation of mechanical equipment,
 - 8.10. Order, manufacture, shipment, delivery, and installation of electrical equipment,
 - 8.11. Sitework,
 - 8.12. Order, manufacture, shipment, delivery, and installation of instrumentation and control equipment,
 - 8.13. Painting,
 - 8.14. All other major construction activities,
 - 8.15. Subcontractor's items of work,
 - 8.16. Punchlist and clean-up,
 - 8.17. Shutdown periods,
 - 8.18. Performance and acceptance testing and supervisory service activities
 - 8.19. Delivery, installation, and checkout of Engineer furnished equipment and materials if applicable,
 - 8.20. Start-up and testing of facilities,
 - 8.21. Operator and maintenance personnel training,
 - 8.22. All contractual milestones, substantial completion dates, and final completion dates,
 - 8.23. Final clean-up, and
 - 8.24. Demobilization
9. Any activity that requires unusual shift work, such as multiple shifts per day, night only work, six or seven day work weeks, etc., shall be clearly identified in the schedule.
 10. The Contractor's schedule shall begin with the date of issuance of the Notice to Proceed and conclude with the date of final completion of the contract. Float, slack time, or contingency within the schedule (i.e., the difference in time between the project's early completion date and the completion date), and total float with the overall schedule, is not for the exclusive use of either the Engineer or the Contractor, but is jointly owned by both and is a resource available to and shared by both parties as needed to meet the contract milestones and the contract completion date.
 11. The Contractor shall not sequester shared float through such strategies as extending activity duration estimates to consume available float, using preferential logic, or using extensive crew or resource sequencing, etc.
 12. The Engineer, within ten (10) working days after receipt of the preliminary Contractor's schedule, shall meet with the Contractor and selected subcontractors requested by the Engineer, to review the schedule submitted. Within ten (10) working days after receipt of the Engineer's written review comments, the Contractor shall revise the preliminary schedule in accordance with the Engineer's comments, and resubmit the schedule to the Engineer. The revised Contractor's schedule shall be accepted or rejected by the Engineer, within ten (10) working days after receipt. It is expected that no more than two (2) submittals of the Contractor's schedule will be needed in order to obtain an accepted schedule.
 - 12.1. If more than two (2) submittals are required, the Engineer shall have the right to withhold approval of progress payments until the Contractor complies with the Engineer's requirements and submits a schedule that is approved.

- 12.2. The Contractor's schedule, when accepted by the Engineer, shall constitute the initial schedule, and shall stand until updated schedules are submitted to reflect actual completed work, approved changes, or recognized delays.
- 12.3. The receipt of the Contractor's schedule shall be a condition precedent to the Contractor receiving his first payment under the contract. No subsequent progress payments will be processed if not accompanied by a current schedule update furnished electronically per paragraph 7.4 of this specification.
13. The Contractor shall execute the Work in accordance with the approved schedule. Upon issuance of a change order or notice to proceed with a change, the approved change shall be reflected in the next schedule submittal by the Contractor, or other schedule update submittal accepted by the Engineer.
14. Once each week, or as requested by the Engineer, the Contractor shall submit a report or schedule listing activities begun, completed, and in progress in the past week, and activities scheduled to begin, be complete or activities in progress for the succeeding two (2) weeks. This report shall cover all work activities listed on the schedule. The report shall be a tabular report, commonly referred to as a "turn-around document," sorted by activity ID number.
15. Predicated upon the results of the Engineer's review of monthly submissions of the updated schedule, or the joint Engineer/Contractor review in any given month, the Contractor may be required to revise the schedule. Conditions under which a revision will be required include the following:
 - 15.1. When a delay in completion of any work activities or sequences of work activities result in an indicated extension of the project completion or milestone dates.
 - 15.2. When delays in submittals or equipment or material deliveries, or work stoppages are encountered which make re-planning or re-scheduling of the work necessary.
 - 15.3. When the schedule does not represent the actual prosecution and progress of the project.
16. All revisions and additions the Contractor's schedule are subject to review and acceptance or rejection by the Engineer.
17. If any time during the project, the Contractor fails to complete any activity by its latest scheduled completion date, which late completion will impact the end date of the work past the contract completion date, or other contractual milestone, the Contractor shall, within five (5) working days, submit to the Engineer a written statement as to when, and how, the Contractor will re-organize his work force to return to the current approved schedule.
18. The written statement must be accompanied by a revised schedule that will indicate how the plan described in the Contractor's written statement will actually affect the current Contractor's schedule.
19. Whenever it becomes apparent from the monthly progress evaluation and updated schedule data that any milestone date(s) or the contract completion date will not be met, the Contractor shall take some or all of the following actions:

- 19.1. Increase manpower in such quantities and crafts on critical activities to substantially eliminate the backlog of work and meet the current completion date.
 - 19.2. Increase the number of working hours per shift, the number of shifts per day, the number of work days per week, or the amount of equipment, or any combination of the foregoing sufficient to substantially eliminate the backlog of work.
 - 19.3. Reschedule work to achieve concurrent accomplishment of work activities.
20. Under no circumstances will the addition of equipment or construction forces, increasing work hours, or any other method, manner, or procedure to return the work to the contractually required completion date, or milestone, be considered justification for a change order. or treated as an acceleration, or entitle the Contractor to additional compensation.
 21. No time extensions shall be granted, nor delay damages paid, unless the delay can be clearly demonstrated by the Contractor on the basis of the updated schedule current as of the month the change was issued, or the delay occurred, and which delay cannot be mitigated, offset, or eliminated through such actions as revising the intended sequence of work or other means.
 22. The schedule shall be cost loaded. Each activity shall be assigned a value that accurately reflects the total cost of the work described, including labor, materials, equipment, subcontracts, etc. These values will not be used for payment purposes. The sum of the values assigned to the activities in the Contractor's schedule shall be equal to the contract value. A resource named "CASH" will be used for cost loading. These values are to be utilized to assist the Authority in cash flow predictions and as an additional measure of project progress.
 23. The schedule shall be resource loaded using man hours of effort. Each activity shall be assigned a value that accurately reflects the total man hours of effort to accomplish the work described. The sum of the values assigned to the activities in the Contractor's schedule shall be equal to the total number of man hours estimated for the project including subcontractors. A resource named "MNHR" will be used for resource loading manhours.
 24. The Contractor shall utilize a sequential naming system for each schedule submittal acceptable to the Engineer. Each schedule submitted to the Engineer will be identified by a unique name conforming to the sequential numbering convention agreed to. Example. A001, A002, A003, A004 etc.
 25. At least once each month, on a date established by the Engineer, a review meeting for the coordination of the schedule will be held. The meeting shall be attended by the Contractor's project manager, superintendent, and scheduler, and those major subcontractors as determined to be necessary by the Engineer or the Contractor.
 26. Time Impact Statements: If the Contractor believes that he is due additional time because of changes made by the Engineer, or Time Suspensions not received in writing from the Engineer, or by other causes not within his control, other than weather, he may request additional time. Such request must be made within fourteen (14) days from the time the event requiring the adjustments occurrence, or within fourteen (14) days from the date the Contractor should have reasonably been expected to know of the event. In no event will any request for additional time be considered after the next months time charges have been

presented to the Contractor by the Engineer. The Engineer can furnish TIS forms upon the Contractor's request.

Each Time Impact Statement must clearly contain the following:

- 26.1. A clear description of the event or reason for the request
- 26.2. The reason the event or cause is not the Contractor's responsibility
- 26.3. Background information or data sheets to support the request
- 26.4. A copy of the portion of the schedule being impacted clearly indicating the activities being impacted before the event and after the event
- 26.5. The amount of time being requested in calendar days

No request for additional time will be considered with out a Time Impact Statement containing all of the information described in this section.

27. Weather Delays – This is a calendar day project. It is the Contractor's responsibility to consider the geographic location including the local weather conditions and the period in which this project will be constructed as well as the contract duration in order to marshal the necessary resources to complete this project on time.

- 27.1. No time extensions will be granted for normal or seasonal rain or adverse weather conditions.
- 27.2. The Contractor may request additional time for unusually severe or adverse weather using paragraph 26 of this section. Such request will be considered in the same manner as any other request for additional time.
- 27.3. The contractor must provide background data on what the expectation for working days was for normal weather using historical weather records versus the actual weather was for the period in question.
- 27.4. Any such claim for unusually severe weather may be offset by the Authority's request for a reduction in the contract duration due to unusually good weather but only to the extent of the Contractor's request for additional days.

If the Contract fails to mobilize within 10 days of the date of the Notice to Proceed, the Owner will be entitled to off-set any requested time extensions by the number of days from the date of the Notice to Proceed to the date of mobilization.

(END OF SECTION)

SPECIAL SPECIFICATION**3061****Fast Track Concrete Pavement**

1. **Description.** Construct fast track concrete pavement, on a prepared subgrade, in accordance with the typical sections shown on the plans. Use fast track concrete pavement on small pavement areas, or leave-outs as shown on the plans for both continuously reinforced and jointed concrete pavements.
2. **Materials.**
 - A. **Hydraulic Cement Concrete.** Unless otherwise shown on the plans or approved by the Engineer, provide Class HES concrete conforming to Item 421, "Hydraulic Cement Concrete," with a minimum average flexural strength of 425 psi in 16 hours. Test in accordance with Tex-448-A.
 - B. **Reinforcing Steel.** Provide reinforcing steel in accordance with Section 360.2.B, "Reinforcing Steel."
 - C. **Curing Materials.** Provide curing materials in accordance with Section 420.2.H, "Curing Materials." Provide insulating blankets for curing concrete pavement with a minimum thermal resistance (R) rating of 0.5 hour-square foot F/BTU. Use insulating blankets that are free from tears and are in good condition.
 - D. **Epoxy.** Provide epoxy in accordance with Section 360.2.D, "Epoxy."
 - E. **Evaporation Retardant.** Provide evaporation retardants in accordance with Section 360.2.E, "Evaporation Retardant."
 - F. **Joint Sealants and Fillers.** Provide joint sealants and fillers in accordance to Section 360.2.F, "Joint Sealants and Fillers."
3. **Equipment.** Provide equipment in accordance with Article 360.3, "Equipment."
4. **Construction.** Obtain approval for adjustments to plan grade-line to maintain thickness over minor subgrade or base high spots while maintaining clearances and drainage. Maintain subgrade or base in a smooth, clean, compacted condition in conformity with the required section and established grade until the pavement concrete is placed. Keep subgrade or base damp with water sufficiently in advance of placing pavement concrete. Adequately light the active work area for all nighttime operations. Provide and maintain tools and materials to perform testing.
 - A. **Paving and Quality Control Plan.** Submit a paving and quality control plan in accordance to Section 360.4.A, "Paving and Quality Control Plan."

- B. Job-Control Testing.** Perform job-control testing in accordance to Section 360.4.B, “Job-Control Testing.”
- C. Reinforcing Steel and Joint Assemblies.** Provide reinforcing steel and joint assemblies in accordance to Section 360.4.C, “Reinforcing Steel and Joint Assemblies.”
- D. Joints.** Provide joints in accordance to Section 360.4.D, “Joints.”
- E. Placing and Removing Forms.** When needed, place and remove forms in accordance to Section 360.4.E except, do not remove forms until at least 6 hours after concrete has been placed. The time for the form removal may be extended, by the Engineer, if weather or other conditions make it advisable.
- F. Concrete Delivery.** Deliver concrete in accordance with Section 360.4.F, “Concrete Delivery.”
- G. Concrete Placement.** Place concrete in accordance with Section 360.4.G, “Concrete Placement.”
- H. Spreading and Finishing.** Spread and finish concrete in accordance with Section 360.4.H, “Spreading and Finishing.”
- I. Curing.** Keep the concrete pavement surface from drying by water fogging or with the use of evaporation retardants until curing material has been applied. Maintain curing and promptly repair damage to curing materials on exposed surfaces of concrete pavement until opening to traffic or until directed.
 - 1. **Wet Mat Curing.** Provide wet mat curing unless otherwise shown on the plans or as directed by the Engineer. Cure the pavement in accordance to Section 420.4.J.2.a, “Wet Mats.” If the air temperature is below 65°F and insulating blanket is used, then apply membrane curing in lieu of wet mat curing.
 - 2. **Membrane Curing.** As approved, provide membrane curing in accordance to Section 360.4.I.1, “Membrane Curing.”
 - 3. **Asphalt Curing.** As approved, provide asphalt curing in accordance to Section 360.4.I.2, “Asphalt Curing.”
- J. Sawing Joints.** Saw joints in accordance to Section 360.4.J, “Sawing Joints.”
- K. Protection of Pavement and Opening to Traffic.**
 - 1. **Protection of Pavement.** Protect pavements in accordance to Section 360.4.K.1, “Protection of Pavement.” When air temperature is below 65°F, cover the pavement with insulating blankets in accordance to Table 1 unless otherwise directed.

**Table 1
Insulating Blanket Curing**

Ambient Air Temperature	Opening Time, Hr				
	8	16	24	36	48
<50°F	Yes	Yes	Yes	Yes	No
50°F-65°F	Yes	Yes	Yes	No	No

2. **Opening Pavements to Traffic.** Close pavement to all traffic, including Contractor vehicles, until the concrete is at least 8 hours old. This time may be extended, by the Engineer, if weather or other conditions make is advisable.

The pavement may be opened to traffic after the concrete has been cured for at least 8 hours and has obtained a minimum a flexural strength of 275 psi or as directed by the Engineer. Determine the flexural strength in accordance with Tex-448-A, "Flexural Strength of Concrete Using Simple Beam Third-Point Loading" using concrete beams cured at the job site under the same conditions as the pavement, or in accordance with Tex-426-A, "Estimating Concrete Strength by the Maturity Method". Opening the pavement does not relieve the Contractor from the responsibility for the work in accordance with Item 7, "Legal Relations and Responsibilities to the Public." Seal all joints and clean the pavement before opening the pavement to traffic.

3. **Emergency Opening to Traffic.** When directed in writing, open the pavement to traffic before the minimum requirements specified above have been attained. Remove all obstructing materials, place stable material against the pavement edges, and perform other work involved in providing for the safety of traffic as required for emergency opening.

L. Pavement Thickness. Verify pavement thickness in accordance to Section 360.4.L, "Pavement Thickness."

M. Ride Quality. Unless otherwise shown on the plans, measure ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces."

5. **Measurement.** Measure pavement in accordance to Article 360.5, "Measurement."

6. **Payment.** These prices are full compensation for materials, equipment, labor, tools, and incidentals.

A. Fast Track Concrete Pavement. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the adjusted unit price bid for "Fast Track Concrete Pavement" of the type and depth specified as adjusted in accordance with Section 6.B, "Deficient Pavement Thickness."

Excavation and embankment required by this Item in the preparation of the subgrade and for the completion of the shoulders and slopes will be measured and paid for in accordance with the provisions of Item 110, "Excavation," or Item 132, "Embankment," with the provisions that yardage will be measured and paid for once only regardless of the manipulation involved; or, where shown on the plans, such work will be measured and paid for in accordance with the provisions of Item 150, "Blading." Measurement of subgrade excavation for payment will be limited to a total width of the pavement plus 1 foot on each side. Payment under excavation items will not be allowed within the areas designated for "Blading."

Sprinkling and rolling, required for the compaction of the rough subgrade in advance of fine-grading is subsidiary to this Item. Maintenance of a moist condition of the subgrade or base in advance of fine-grading and concrete is subsidiary work, as provided above.

- B. Deficient Pavement Thickness.** Where the average thickness of pavement is deficient in thickness by more than 0.2 in. but not more than 0.75 in., payment will be made using the adjusted factor as specified in Table 2 applied to the bid price for deficient area for each unit as defined under Section 360.4.L.3, “Pavement Units for Payment Adjustments.”

**Table 2
Deficient Thickness Price Adjustment Factor**

Deficiency in Thickness Determined by Cores (in.)	Proportional Part of Contract Price Allowed (adjustment factor)
Not Deficient	1.00
Over 0.00 through 0.20	1.00
Over 0.20 through 0.30	0.80
Over 0.30 through 0.40	0.72
Over 0.40 through 0.50	0.68
Over 0.50 through 0.75	0.57

- C. Curb.** Work performed and furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Curb” of the type specified.

SPECIAL SPECIFICATION

3268

Dense-Graded Hot-Mix Asphalt

1. **Description.** Construct a hot-mix asphalt (HMA) pavement layer composed of a compacted, dense-graded mixture of aggregate and asphalt binder mixed hot in a mixing plant. Pay adjustments will apply to HMA placed under this specification unless the HMA is deemed exempt in accordance with Section 3268.4.I.4, “Exempt Production.”
2. **Materials.** Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications.

Notify the Engineer of all material sources. Notify the Engineer before changing any material source or formulation. When the Contractor makes a source or formulation change, the Engineer will verify that the specification requirements are met and may require a new laboratory mixture design, trial batch, or both. The Engineer may sample and test project materials at any time during the project to verify specification compliance in accordance with Item 6, “Control of Materials.”

A. Aggregate. Furnish aggregates from sources that conform to the requirements shown in Table 1 and as specified in this Section. Aggregate requirements in this Section, including those shown in Table 1, may be modified or eliminated when shown on the plans. Additional aggregate requirements may be specified when shown on the plans. Provide aggregate stockpiles that meet the definitions in this Section for coarse, intermediate, or fine aggregate. Aggregate from reclaimed asphalt pavement (RAP) is not required to meet Table 1 requirements unless otherwise shown on the plans. Supply aggregates that meet the definitions in Tex-100-E for crushed gravel or crushed stone. The Engineer will designate the plant or the quarry as the sampling location. Samples must be from materials produced for the project. The Engineer will establish the surface aggregate classification (SAC) and perform Los Angeles abrasion, magnesium sulfate soundness, and Micro-Deval tests. Perform all other aggregate quality tests listed in Table 1. Document all test results on the mixture design report. The Engineer may perform tests on independent or split samples to verify Contractor test results. Stockpile aggregates for each source and type separately. Determine aggregate gradations for mixture design and production testing based on the washed sieve analysis given in Tex-200-F, Part II.

1. **Coarse Aggregate.** Coarse aggregate stockpiles must have no more than 20% material passing the No. 8 sieve. Aggregate from sources listed in the Department’s *Bituminous Rated Source Quality Catalog* (BRSQC) located at <http://www.txdot.gov/business/resources/producer-list.html> are preapproved for use.

For sources not listed on the Department's BRSQC:

- build an individual stockpile for each material;
- request the Department test the stockpile for specification compliance; and
- once approved, do not add material to the stockpile unless otherwise approved.

Use only the rated values for hot mix listed in the BRSQC. Rated values for surface treatment (ST) do not apply to coarse aggregate sources used in hot mix. Provide aggregate from non-listed sources only when tested by the Engineer and approved before use. Allow 30 calendar days for the Engineer to sample, test, and report results for non-listed sources.

Provide coarse aggregate with at least the minimum SAC as shown on the plans. SAC requirements apply only to aggregates used on the surface of travel lanes. SAC requirements apply to aggregates used on surfaces other than travel lanes when shown on the plans. The SAC for sources on the Department's Aggregate Quality Monitoring Program (AQMP) is listed in the BRSQC.

- a. Blending Class A and Class B Aggregates.** Class B aggregate meeting all other requirements in Table 1 may be blended with a Class A aggregate in order to meet requirements for Class A materials. When blending Class A and B aggregates to meet a Class A requirement, ensure that at least 50% by weight of the material retained on the No. 4 sieve comes from the Class A aggregate source. Blend by volume if the bulk specific gravities of the Class A and B aggregates differ by more than 0.300. For blending purposes, coarse aggregate from RAP and Recycled Asphalt Shingles (RAS) will be considered as Class B aggregate.

When the Contractor blends Class A and B aggregates to meet a Class A requirement, the Engineer may perform tests at any time during production to ensure that at least 50% by weight of the material retained on the No. 4 sieve comes from the Class A aggregate source. In such cases where the Engineer elects to verify conformance, the Engineer will use the Department's mix design Excel template to calculate the percent of Class A aggregate retained on the No. 4 sieve by inputting the bin percentages shown from readouts in the control room at the time of production and stockpile gradations measured at the time of production. The Engineer may determine the gradations based on either washed or dry sieve analysis from samples obtained from individual aggregate cold feed bins or aggregate stockpiles. The Engineer may perform spot checks using the gradations supplied by the Contractor on the mixture design report as an input for the Excel template; however, a failing spot check will require confirmation with a stockpile gradation determined by the Engineer.

- b. Micro-Deval Abrasion.** The Engineer will perform a minimum of one Micro-Deval abrasion test in accordance with Tex-461-A for each coarse aggregate source used in the mixture design that has a Rated Source Soundness

Magnesium (RSSM) loss value greater than 15 as listed in the BRSQC. The Engineer will perform testing prior to the start of production and may perform additional testing at any time during production. The Engineer may obtain the coarse aggregate samples from each coarse aggregate source or may require the Contractor to obtain the samples. The Engineer may elect to waive all Micro-Deval testing based on a satisfactory test history of the same aggregate source.

When tested, the Engineer will estimate the magnesium sulfate soundness loss for each coarse aggregate source 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 will consult the Geotechnical, Soils, and Aggregates Branch of the Construction Division, and additional testing may be required prior to granting approval.

- 2. Intermediate Aggregate.** Aggregates not meeting the definition of coarse or fine aggregate will be defined as intermediate aggregate. When used, supply intermediate aggregates that are free from organic impurities. The Engineer may test the intermediate aggregate in accordance with Tex-408-A to verify the material is free from organic impurities. When used, supply intermediate aggregate from coarse aggregate sources that meet the requirements shown in Table 1 unless otherwise approved.

If 10% or more of the stockpile is retained on the No. 4 sieve, test the stockpile and verify that it meets the requirements in Table 1 for coarse aggregate angularity (Tex-460-A) and flat and elongated particles (Tex-280-F).

- 3. Fine Aggregate.** Fine aggregates consist of manufactured sands, screenings, and field sands. Fine aggregate stockpiles must meet the gradation requirements in Table 2. Supply fine aggregates that are free from organic impurities. The Engineer may test the fine aggregate in accordance with Tex-408-A to verify the material is free from organic impurities. At most 15% of the total aggregate may be field sand or other uncrushed fine aggregate. With the exception of field sand, use fine aggregate from coarse aggregate sources that meet the requirements shown in Table 1 unless otherwise approved.

If 10% or more of the stockpile is retained on the No. 4 sieve, test the stockpile and verify that it meets the requirements in Table 1 for coarse aggregate angularity (Tex-460-A) and flat and elongated particles (Tex-280-F).

**Table 1
Aggregate Quality Requirements**

Property	Test Method	Requirement
Coarse Aggregate		
SAC	AQMP	As shown on plans
Deleterious material, %, max	Tex-217-F, Part I	1.5
Decantation, %, max	Tex-217-F, Part II	1.5
Micro-Deval abrasion, %, max	Tex-461-A	Note 1
Los Angeles abrasion, %, max	Tex-410-A	40
Magnesium sulfate soundness, 5 cycles, %, max	Tex-411-A	30
Coarse aggregate angularity, 2 crushed faces, %, min	Tex-460-A, Part I	85 ²
Flat and elongated particles @ 5:1, %, max	Tex-280-F	10
Fine Aggregate		
Linear shrinkage, %, max	Tex-107-E	3
Combined Aggregate³		
Sand equivalent, %, min	Tex-203-F	45

1. Used to estimate the magnesium sulfate soundness loss in accordance with Section 3268.2.A.1, "Coarse Aggregate."

2. Only applies to crushed gravel.

3. Aggregates, without mineral filler, RAP, RAS, or additives, combined as used in the job-mix formula (JMF).

**Table 2
Gradation Requirements for Fine Aggregate**

Sieve Size	% Passing by Weight or Volume
3/8"	100
#8	70–100
#200	0–30

B. Mineral Filler. Mineral filler consists of finely divided mineral matter, such as agricultural lime, crusher fines, hydrated lime, or fly ash. Mineral filler is allowed unless otherwise shown on the plans. Do not use more than 2% mineral hydrated lime unless otherwise shown on the plans. If a substitute binder is used, do not use more than 1% hydrated lime unless otherwise shown on the plans or allowed by the Engineer. Test all mineral fillers except hydrated lime and fly ash in accordance with Tex-107-E to ensure specification compliance. The plans may require or disallow specific mineral fillers. When used, provide mineral filler that:

- is sufficiently dry, free-flowing, and free from clumps and foreign matter;
- does not exceed 3% linear shrinkage when tested in accordance with Tex-107-E; and
- meets the gradation requirements in Table 3.

**Table 3
Gradation Requirements for Mineral Filler**

Sieve Size	% Passing by Weight or Volume
#8	100
#200	55–100

- C. **Baghouse Fines.** Fines collected by the baghouse or other dust-collecting equipment may be reintroduced into the mixing drum.
- D. **Asphalt Binder.** Furnish the type and grade of performance-graded (PG) asphalt specified on the plans.
- E. **Tack Coat.** Furnish CSS-1H, SS-1H, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder in accordance with Item 300, "Asphalts, Oils, and Emulsions." Specialized or preferred tack coat materials may be allowed by the Engineer or required when shown on the plans. Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use.

The Engineer will obtain at least one sample of the tack coat binder per project in accordance with Tex-500-C, Part III, and test it to verify compliance with Item 300. The Engineer will obtain the sample from the asphalt distributor immediately before use.

- F. **Additives.** Use the type and rate of additive specified when shown on the plans. Other additives that facilitate mixing, compaction, or improve the quality of the mixture may be allowed when approved. Provide the Engineer with documentation such as the bill of lading showing the quantity of additives used in the project unless otherwise directed.

- 1. **Lime and Liquid Antistripping Agent.** When lime or a liquid antistripping agent is used, add in accordance with Item 301, "Asphalt Antistripping Agents." Do not add lime directly into the mixing drum of any plant where lime is removed through the exhaust stream unless the plant has a baghouse or dust collection system that reintroduces the lime into the drum.

- 2. **Warm Mix Asphalt (WMA).** Warm Mix Asphalt (WMA) is defined as HMA that is produced within a target temperature discharge range of 215°F and 275°F using Department-approved WMA additives or processes. The Department's Material Producer List of WMA additives and processes is located at <http://www.txdot.gov/business/resources/producer-list.html>.

WMA is allowed for use on all projects and is required when shown on plans. The maximum placement or target discharge temperature for WMA may be set at a value less than 275°F when shown on the plans.

Department-approved WMA additives or processes may be used to facilitate mixing and compaction of HMA produced at target discharge temperatures greater than 275°F; however, such mixtures will not be defined as WMA.

- G. **Recycled Materials.** Use of RAP and RAS is permitted unless otherwise shown on the plans. Do not exceed the maximum allowable percentages of RAP and RAS shown in Table 4. The allowable percentages shown in Table 4 may be decreased or increased when shown on the plans. Determine asphalt content and gradation of the RAP and RAS stockpiles for mixture design purposes in accordance with Tex-236-F. The Engineer may verify the asphalt content of the stockpiles at any time during production. Perform other tests on RAP and RAS when shown on the plans. Asphalt binder from RAP and RAS is designated as recycled asphalt binder. When RAP or RAS is used, calculate and ensure that the ratio of the recycled asphalt binder to total binder does not

exceed the percentages shown in Table 5 during mixture design and HMA production. During HMA production, use a separate cold feed bin for each stockpile of RAP and RAS.

Surface, intermediate, and base mixes referenced in Tables 4 and 5 are defined as follows:

- "Surface" mixes are the final lift or riding surface of the pavement structure;
 - "Intermediate" mixes are non-surface mixtures placed less than or equal to 8 inches from the riding surface; and
 - "Base" mixes are non-surface mixtures placed greater than 8 inches from the riding surface.
1. **RAP.** RAP is salvaged, milled, pulverized, broken, or crushed asphalt pavement. Crush or break RAP so that 100% of the particles pass the 2 in. sieve.

Use of Contractor-owned RAP including HMA plant waste is permitted unless otherwise shown on the plans. Department-owned RAP stockpiles are available for the Contractor's use when the stockpile locations are shown on the plans. If Department-owned RAP is available for the Contractor's use, the Contractor may use Contractor-owned fractionated RAP and replace it with an equal quantity of Department-owned RAP. This allowance does not apply to a Contractor using unfractionated RAP. Department-owned RAP generated through required work on the Contract is available for the Contractor's use when shown on the plans. Perform any necessary tests to ensure Contractor- or Department-owned RAP is appropriate for use. The Department will not perform any tests or assume any liability for the quality of the Department-owned RAP unless otherwise shown on the plans. The Contractor will retain ownership of RAP generated on the project when shown on the plans.

Fractionated RAP is defined as having two or more RAP stockpiles, divided into coarse and fine fractions. The coarse RAP stockpile will contain only material retained by processing over a 3/8 in. screen or 1/2 in. screen unless otherwise approved. The fine RAP stockpile will contain only material passing the 3/8 in. screen or 1/2 in. screen unless otherwise approved. The Engineer may allow the Contractor to use an alternate to the 3/8 in. screen or 1/2 in. screen to fractionate the RAP. The maximum percentages of fractionated RAP may be comprised of coarse or fine fractionated RAP or the combination of both coarse and fine fractionated RAP.

Do not use Department- or Contractor-owned RAP contaminated with dirt or other objectionable materials. Do not use Department- or Contractor-owned RAP if the decantation value exceeds 5% and the plasticity index is greater than 8. Test the stockpiled RAP for decantation in accordance with Tex-406-A, Part I. Determine the plasticity index in accordance with Tex-106-E if the decantation value exceeds 5%. The decantation and plasticity index requirements do not apply to RAP samples with asphalt removed by extraction or ignition.

Do not intermingle Contractor-owned RAP stockpiles with Department-owned RAP stockpiles. Remove unused Contractor-owned RAP material from the project site upon completion of the project. Return unused Department-owned RAP to the designated stockpile location.

**Table 4
Maximum Allowable Amounts of RAP¹**

Maximum Allowable Fractionated RAP ² (%)			Maximum Allowable Unfractionated RAP ³ (%)		
Surface	Intermediate	Base	Surface	Intermediate	Base
20.0	30.0	40.0	10.0	10.0	10.0

1. Must also meet the recycled binder to total binder ratio shown in Table 5.

2. Up to 5% RAS may be used separately or as a replacement for fractionated RAP.

3. Unfractionated RAP may not be combined with fractionated RAP or RAS.

- 2. RAS.** Use of post-manufactured RAS or post-consumer RAS (tear-offs) is permitted unless otherwise shown on the plans. Up to 5% RAS may be used separately or as a replacement for fractionated RAP in accordance with Table 4 and Table 5. RAS is defined as processed asphalt shingle material from manufacturing of asphalt roofing shingles or from re-roofing residential structures. Post-manufactured RAS is processed manufacturer’s shingle scrap by-product. Post-consumer RAS is processed shingle scrap removed from residential structures. Comply with all regulatory requirements stipulated for RAS by the Texas Commission on Environmental Quality (TCEQ). RAS may be used separately or in conjunction with RAP.

Process the RAS by ambient grinding or granulating such that 100% of the particles pass the 3/8 in. sieve when tested in accordance with Tex-200-F, Part I. Perform a sieve analysis on processed RAS material prior to extraction (or ignition) of the asphalt.

Add sand meeting the requirements of Table 1 and Table 2 or fine RAP to RAS stockpiles if needed to keep the processed material workable. For any stockpile that contains RAS, the entire stockpile will be considered a RAS stockpile and be limited to no more than 5.0% of the HMA mixture in accordance with Table 4.

Certify compliance of the RAS with DMS-11000, “Evaluating and Using Nonhazardous Recyclable Materials (NRM) Guidelines.” If the RAS has not come into contact with any hazardous materials, treat it as an established NRM. Use RAS from shingle sources on the Department’s Material Producer List of NRM located at <http://www.txdot.gov/business/resources/producer-list.html>. Prior to use, remove substantially all materials that are not part of the shingle, such as wood, paper, metal, plastic, and felt paper. Determine the deleterious content of RAS material for mixture design purposes in accordance with Tex-217-F, Part III. Do not use RAS if deleterious materials are more than 0.5% of the stockpiled RAS unless otherwise approved. Submit a sample for approval to the Engineer prior to submitting the mixture design. The Department will perform the testing for deleterious material of RAS to determine specification compliance.

H. Substitute Binders. Unless otherwise shown on the plans, the Contractor may use a substitute PG binder listed in Table 5 in lieu of the PG binder originally specified, if the substitute PG binder and mixture made with the substitute PG binder meet the following:

- the substitute binder meets the specification requirements for the substitute binder grade in accordance with Section 300.2.J, “Performance-Graded Binders”;
- the substitute binder has an un-aged dynamic shear value less than or equal to 2.00 kPa and an RTFO aged dynamic shear value less than or equal to 5.00 kPa at the PG test temperature; and
- the mixture has less than 10.0 mm of rutting on the Hamburg Wheel test (Tex-242-F) after the number of passes required for the originally specified binder. Use of substitute PG binders may only be allowed at the discretion of the Engineer if the Hamburg Wheel test results are between 10.0 mm and 12.5 mm.

Table 5
Allowable Substitute PG Binders and Maximum Recycled Binder Ratios

Originally Specified PG Binder	Allowable Substitute PG Binder	Maximum Ratio of Recycled Binder ¹ to Total Binder (%)		
		Surface	Intermediate	Base
HMA				
76-22 ²	70-22 or 64-22	20.0	20.0	20.0
	70-28 or 64-28	30.0	35.0	40.0
70-22 ²	64-22	20.0	20.0	20.0
	64-28 or 58-28	30.0	35.0	40.0
64-22 ²	58-28	30.0	35.0	40.0
76-28 ²	70-28 or 64-28	20.0	20.0	20.0
	64-34	30.0	35.0	40.0
70-28 ²	64-28 or 58-28	20.0	20.0	20.0
	64-34 or 58-34	30.0	35.0	40.0
64-28 ²	58-28	20.0	20.0	20.0
	58-34	30.0	35.0	40.0
WMA³				
76-22 ²	70-22 or 64-22	30.0	35.0	40.0
70-22 ²	64-22 or 58-28	30.0	35.0	40.0
64-22 ⁴	58-28	30.0	35.0	40.0
76-28 ²	70-28 or 64-28	30.0	35.0	40.0
70-28 ²	64-28 or 58-28	30.0	35.0	40.0
64-28 ⁴	58-28	30.0	35.0	40.0

1. Combined recycled binder from RAP and RAS.

2. Use no more than 20.0% recycled binder when using this originally specified PG binder.

3. WMA as defined in Section 3268.2.F.2, "Warm Mix Asphalt (WMA)."

4. When used with WMA, this originally specified PG binder is allowed for use at the maximum recycled binder ratios shown in this table.

3. **Equipment.** Provide required or necessary equipment in accordance with Item 320, “Equipment for Asphalt Concrete Pavement.”
4. **Construction.** Produce, haul, place, and compact the specified paving mixture. In addition to tests required by the specification, Contractors may perform other QC tests as deemed necessary. At any time during the project, the Engineer may perform production and placement tests as deemed necessary in accordance with Item 5, “Control of the Work.” On or before the first day of paving, it is mandatory to schedule and participate in a pre-paving meeting with the Engineer unless otherwise shown on the plans.
 - A. **Certification.** Personnel certified by the Hot Mix Asphalt Center Certification Program must conduct all mixture designs, sampling, and testing in accordance with Table 6. Supply the Engineer with a list of certified personnel and copies of their current certificates before beginning production and when personnel changes are made. Provide a mixture design that is developed and signed by a Level 2 certified specialist. Provide a Level 1A certified specialist at the plant during production operations. Provide a Level 1B certified specialist to conduct placement tests.

**Table 6
Test Methods, Test Responsibility, and Minimum Certification Levels**

Test Description	Test Method	Contractor	Engineer	Level
1. Aggregate and Recycled Material Testing				
Sampling	Tex-400-A	✓	✓	1A
Dry sieve	Tex-200-F, Part I	✓	✓	1A
Washed sieve	Tex-200-F, Part II	✓	✓	1A
Deleterious material	Tex-217-F, Parts I & III	✓	✓	1A
Decantation	Tex-217-F, Part II	✓	✓	1A
Los Angeles abrasion	Tex-410-A		✓	
Magnesium sulfate soundness	Tex-411-A		✓	
Micro-Deval abrasion	Tex-461-A		✓	
Coarse aggregate angularity	Tex-460-A	✓	✓	2
Flat and elongated particles	Tex-280-F	✓	✓	2
Linear shrinkage	Tex-107-E	✓	✓	2
Sand equivalent	Tex-203-F	✓	✓	2
Organic impurities	Tex-408-A	✓	✓	2
2. Asphalt Binder & Tack Coat Sampling				
Asphalt binder sampling	Tex-500-C, Part II	✓	✓	1A/1B
Tack coat sampling	Tex-500-C, Part III	✓	✓	1A/1B
3. Mix Design & Verification				
Design and JMF changes	Tex-204-F	✓	✓	2
Mixing	Tex-205-F	✓	✓	2
Molding (TGC)	Tex-206-F	✓	✓	1A
Molding (SGC)	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F	✓	✓	1A
VMA ¹ (calculation only)	Tex-204-F	✓	✓	2
Rice gravity	Tex-227-F	✓	✓	1A
Ignition oven correction factors ²	Tex-236-F	✓	✓	2
Indirect tensile strength	Tex-226-F	✓	✓	2
Hamburg wheel test	Tex-242-F	✓	✓	2
Boil test	Tex-530-C	✓	✓	1A
4. Production Testing				
Selecting random numbers	Tex-225-F, Part I		✓	1A
Mixture sampling	Tex-222-F	✓	✓	1A
Molding (TGC)	Tex-206-F	✓	✓	1A
Molding (SGC)	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F	✓	✓	1A
VMA ¹ (calculation only)	Tex-204-F	✓	✓	1A
Rice gravity	Tex-227-F	✓	✓	1A
Gradation & asphalt content ²	Tex-236-F	✓	✓	1A
Control charts	Tex-233-F	✓	✓	1A
Moisture content	Tex-212-F	✓	✓	1A
Hamburg Wheel test	Tex-242-F	✓	✓	2
Micro-Deval abrasion	Tex-461-A		✓	
Boil test	Tex-530-C	✓	✓	1A
Aging ratio	Tex-211-F		✓	
Overlay test	Tex-248-F		✓	
Cantabro loss	Tex-245-F		✓	
5. Placement Testing				
Selecting random numbers	Tex-225-F, Part II		✓	1A/1B
Trimming roadway cores	Tex-207-F	✓	✓	1A/1B
In-place air voids	Tex-207-F	✓	✓	1A/1B
Establish rolling pattern	Tex-207-F	✓		1B
Control charts	Tex-233-F	✓	✓	1A
Ride quality measurement	Tex-1001-S	✓	✓	Note 3
Segregation (density profile)	Tex-207-F, Part V	✓	✓	1B
Longitudinal joint density	Tex-207-F, Part VII	✓	✓	1B
Thermal profile	Tex-244-F	✓	✓	1B

1. Voids in mineral aggregates.

2. Refer to Section 3268.4.1.2.c for exceptions to using an ignition oven.

3. Profiler and operator are required to be certified at the Texas Transportation Institute facility when Surface Test Type B is specified.

B. Reporting and Responsibilities. Use Department-provided Excel templates to record and calculate all test data including but not limited to mixture design, production and placement QC/QA, control charts, thermal profiles, segregation density profiles, and longitudinal joint density. Obtain the latest version of the Excel templates at <http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/forms/site-manager.html> or from the Engineer. The Engineer and the Contractor will provide any available test results to the other party when requested. The maximum allowable time for the Contractor and Engineer to exchange test data is as given in Table 7 unless otherwise approved. The Engineer and the Contractor will immediately report to the other party any test result that requires suspension of production or placement, a payment penalty, or that fails to meet the specification requirements. Record and submit all test results and pertinent information on Department-provided Excel templates to the Engineer electronically by means of a portable USB flash drive, compact disc, or via email.

Subsequent sublots placed after test results are available to the Contractor, which require suspension of operations, may be considered unauthorized work. Unauthorized work will be accepted or rejected at the discretion of the Engineer in accordance with Section 5.3, “Conformity with Plans, Specifications, and Special Provisions.”

**Table 7
Reporting Schedule**

Description	Reported By	Reported To	To Be Reported Within
<i>Production Quality Control</i>			
Gradation ¹ Asphalt content ¹ Laboratory-molded density ² Moisture content ³ Boil test ³	Contractor	Engineer	1 working day of completion of the sublot
<i>Production Quality Assurance</i>			
Gradation ³ Asphalt content ³ Laboratory-molded density ¹ Hamburg wheel test ² Boil test ³ Binder tests ²	Engineer	Contractor	1 working day of completion of the sublot
<i>Placement Quality Control</i>			
In-place air voids ² Segregation ¹ Longitudinal joint density ¹ Thermal profile ¹	Contractor	Engineer	1 working day of completion of the lot
<i>Placement Quality Assurance</i>			
In-place air voids ¹ Segregation ² Longitudinal joint density ² Thermal profile ² Aging ratio ²	Engineer	Contractor	1 working day of receipt of the trimmed cores for in-place air voids ⁴
Pay adjustment summary	Engineer	Contractor	2 working days of performing all required tests and receiving Contractor test data

1. These tests are required on every sublot.
2. Optional test. To be reported as soon as results become available.
3. To be performed at the frequency specified on the plans.
4. 2 days are allowed if cores cannot be dried to constant weight within 1 day.

The Engineer will use the Department-provided Excel template to calculate all pay adjustment factors for the lot. Sublot samples may be discarded after the Engineer and Contractor sign off on the pay adjustment summary documentation for the lot.

Use the procedures described in Tex-233-F to plot the results of all quality control (QC) and quality assurance (QA) testing. Update the control charts as soon as test results for each sublot become available. Make the control charts readily accessible at the field laboratory. The Engineer may suspend production for failure to update control charts.

- C. Quality Control Plan (QCP).** Develop and follow the QCP in detail. Obtain approval from the Engineer for changes to the QCP made during the project. The Engineer may suspend operations if the Contractor fails to comply with the QCP.

Submit a written QCP to the Engineer before the mandatory pre-paving meeting. Receive the Engineer's approval of the QCP before beginning production. Include the following items in the QCP:

- 1. Project Personnel.** For project personnel, include:
 - a list of individuals responsible for QC with authority to take corrective action;
 - contact information for each individual listed; and
 - copies of certification documents for individuals performing specified QC functions.
- 2. Material Delivery and Storage.** For material delivery and storage, include:
 - the sequence of material processing, delivery, and minimum quantities to assure continuous plant operations;
 - aggregate stockpiling procedures to avoid contamination and segregation;
 - frequency, type, and timing of aggregate stockpile testing to assure conformance of material requirements before mixture production; and
 - procedure for monitoring the quality and variability of asphalt binder.
- 3. Production.** For production, include:
 - loader operation procedures to avoid contamination in cold bins;
 - procedures for calibrating and controlling cold feeds;
 - procedures to eliminate debris or oversized material;
 - procedures for adding and verifying rates of each applicable mixture component (e.g., aggregate, asphalt binder, RAP, RAS, lime, liquid antistripping);
 - procedures for reporting job control test results; and
 - procedures to avoid segregation and drain-down in the silo.
- 4. Loading and Transporting.** For loading and transporting, include:
 - type and application method for release agents; and
 - truck loading procedures to avoid segregation.

- 5. Placement and Compaction.** For placement and compaction, include:
- proposed agenda for mandatory pre-paving meeting, including date and location;
 - proposed paving plan (e.g., paving widths and lift thicknesses);
 - type and application method for release agents in the paver and on rollers, shovels, lutes, and other utensils;
 - procedures for the transfer of mixture into the paver, while avoiding segregation and preventing material spillage;
 - process to balance production, delivery, paving, and compaction to achieve continuous placement operations and good ride quality;
 - paver operations (e.g., operation of wings, height of mixture in auger chamber) to avoid physical and thermal segregation and other surface irregularities; and
 - procedures to construct quality longitudinal and transverse joints.

D. Mixture Design.

- 1. Design Requirements.** The Contractor may elect to design the mixture using a Texas Gyrotory Compactor (TGC) or a Superpave Gyrotory Compactor (SGC) unless otherwise shown on the plans. Use the typical weight design example given in Tex-204-F, Part I, when using a TGC. Use the Superpave mixture design procedure given in Tex-204-F, Part IV, when using a SGC. Design the mixture to meet the requirements listed in Tables 1, 2, 3, 4, 5, 8, 9, and 10.
- a. Target Laboratory Molded Density When The TGC Is Used.** Design the mixture at a 96.5% target laboratory-molded density or as noted in Table 9. The target laboratory-molded density may be increased in 0.5% increments, not to exceed 97.0%, at the Contractor's discretion.
- b. Design Number of Gyration (N_{design}) When The SGC Is Used.** Design the mixture at 50 gyrations (N_{design}). Use a target laboratory-molded density of 96.0% to design the mixture; however, adjustments can be made to the N_{design} value as noted in Table 9. The N_{design} level may be reduced to no less than 35 gyrations at the Contractor's discretion.

Use an approved laboratory to perform the Hamburg Wheel test and provide results with the mixture design, or provide the laboratory mixture and request that the Department perform the Hamburg Wheel test. The Department maintains the Material Producer List of approved laboratories located at <http://www.txdot.gov/business/resources/producer-list.html>. The Engineer will be allowed 10 working days to provide the Contractor with Hamburg Wheel test results on the laboratory mixture design.

The Engineer will provide the mixture design when shown on the plans. The Contractor may submit a new mixture design at any time during the project. The Engineer will verify and approve all mixture designs (JMF1) before the Contractor can begin production.

Provide the Engineer with a mixture design report using the Department-provided Excel template. Include the following items in the report:

- the combined aggregate gradation, source, specific gravity, and percent of each material used;
- asphalt content and aggregate gradation of RAP and RAS stockpiles;
- the target laboratory-molded density (or Ndesign level when using the SGC);
- results of all applicable tests;
- the mixing and molding temperatures;
- the signature of the Level 2 person or persons that performed the design;
- the date the mixture design was performed; and
- a unique identification number for the mixture design.

**Table 8
Master Gradation Limits (% Passing by Weight or Volume)
and VMA Requirements**

Sieve Size	A Coarse Base	B Fine Base	C Coarse Surface	D Fine Surface	F Fine Mixture
2"	100.0 ¹	–	–	–	–
1-1/2"	98.0–100.0	100.0 ¹	–	–	–
1"	78.0–94.0	98.0–100.0	100.0 ¹	–	–
3/4"	64.0–85.0	84.0–98.0	95.0–100.0	100.0 ¹	–
1/2"	50.0–70.0	–	–	98.0–100.0	100.0 ¹
3/8"	–	60.0–80.0	70.0–85.0	85.0–100.0	98.0–100.0
#4	30.0–50.0	40.0–60.0	43.0–63.0	50.0–70.0	70.0–90.0
#8	22.0–36.0	29.0–43.0	32.0–44.0	35.0–46.0	38.0–48.0
#30	8.0–23.0	13.0–28.0	14.0–28.0	15.0–29.0	12.0–27.0
#50	3.0–19.0	6.0–20.0	7.0–21.0	7.0–20.0	6.0–19.0
#200	2.0–7.0	2.0–7.0	2.0–7.0	2.0–7.0	2.0–7.0
Design VMA, % Minimum					
–	12.0	13.0	14.0	15.0	16.0
Production (Plant-Produced) VMA, % Minimum					
–	11.0	12.0	13.0	14.0	15.0

1. Defined as maximum sieve size. No tolerance allowed.

**Table 9
Laboratory Mixture Design Properties**

Mixture Property	Test Method	Requirement
Target laboratory-molded density, % (TGC)	Tex-207-F	96.5 ¹
Design gyrations (Ndesign for SGC)	Tex-241-F	50 ²
Indirect tensile strength (dry), psi	Tex-226-F	85–200 ³
Boil test ⁴	Tex-530-C	–

1. May be adjusted in 0.5% increments within a range of 96.0% to 97.5% when shown on the plans or specification or when mutually agreed between the Engineer and Contractor.

2. May be adjusted within a range of 35–100 gyrations when shown on the plans or specification or when mutually agreed between the Engineer and Contractor.

3. The Engineer may allow the IDT strength to exceed 200 psi if the corresponding Hamburg Wheel rut depth is greater than 3.0 mm and less than 12.5 mm.

4. Used to establish baseline for comparison to production results. May be waived when approved.

**Table 10
Hamburg Wheel Test Requirements**

High-Temperature Binder Grade	Test Method	Minimum # of Passes¹ @ 12.5 mm² Rut Depth, Tested @ 50°C
PG 64 or lower	Tex-242-F	10,000
PG 70		15,000
PG 76 or higher		20,000

1. May be decreased or waived when shown on the plans.
2. When the rut depth at the required minimum number of passes is less than 3 mm, the Engineer may require the Contractor to increase the target laboratory-molded density (TGC) by 0.5% to no more than 97.5% or lower the Ndesign level (SGC) to no less than 35 gyrations.

2. Job-Mix Formula Approval. The job-mix formula (JMF) is the combined aggregate gradation, target laboratory molded density (or Ndesign level), and target asphalt percentage used to establish target values for hot mix production. JMF1 is the original laboratory mixture design used to produce the trial batch. When WMA is used, JMF1 may be designed and submitted to the Engineer without including the WMA additive. When WMA is used, document the additive or process used and recommend rate on the JMF1 submittal. The Engineer and the Contractor will verify JMF1 based on plant-produced mixture from the trial batch unless otherwise approved. The Engineer may accept an existing mixture design previously used on a Department project and may waive the trial batch to verify JMF1. The Department may require the Contractor to reimburse the Department for verification tests if more than two trial batches per design are required.

a. Contractor’s Responsibilities.

- (1) Providing Gyratory Compactor.** Use a TGC calibrated in accordance with Tex-914-K when electing or required to design the mixture in accordance with Tex-204-F, Part I, for molding production samples. Furnish an SGC calibrated in accordance with Tex-241-F when electing or required to design the mixture in accordance with Tex-204-F, Part IV, for molding production samples. If the SGC is used, locate the SGC at the Engineer’s field laboratory and make the SGC available to the Engineer for use in molding production samples.
- (2) Gyratory Compactor Correlation Factors.** Use Tex-206-F, Part II, to perform a gyratory compactor correlation when the Engineer uses a different gyratory compactor. Apply the correlation factor to all subsequent production test results.
- (3) Submitting JMF1.** Furnish the Engineer a mix design report (JMF1) with representative samples of all component materials and request approval to produce the trial batch. If opting to have the Department perform the Hamburg Wheel test on the laboratory mixture, provide the Engineer with approximately 10,000 g of the design mixture and request that the Department perform the Hamburg Wheel test.

- (4) **Supplying Aggregate.** Provide the Engineer with approximately 40 lb. of each aggregate stockpile unless otherwise directed.
- (5) **Supplying Asphalt.** Provide the Engineer at least 1 gal. of the asphalt material and sufficient quantities of any additives proposed for use.
- (6) **Ignition Oven Correction Factors.** Determine the aggregate and asphalt correction factors from the ignition oven in accordance with Tex-236-F. Prior to the trial batch production, provide the Engineer with split samples of the mixtures, including all additives (except water), and blank samples used to determine the correction factors for the ignition oven used for quality assurance testing during production. Correction factors established from a previously approved mixture design may be used for the current mixture design, if the mixture design and ignition oven are the same as previously used unless otherwise directed.
- (7) **Boil Test.** Perform the test and retain the tested sample from Tex-530-C until completion of the project or as directed by the Engineer. Use this sample for comparison purposes during production. The Engineer may waive the requirement for the boil test.
- (8) **Trial Batch Production.** Upon receiving conditional approval of JMF1 and authorization from the Engineer to produce a trial batch, provide a plant-produced trial batch, including the WMA additive or process, if applicable, for verification testing of JMF1 and development of JMF2. Produce a trial batch mixture that meets the requirements in Table 4, Table 5, and Table 11. In lieu of a new trial batch, the Engineer may accept test results from recent production of the same mixture.
- (9) **Trial Batch Production Equipment.** To produce the trial batch, use only equipment and materials proposed for use on the project.
- (10) **Trial Batch Quantity.** Produce enough quantity of the trial batch to ensure that the mixture meets the specification requirements.
- (11) **Number of Trial Batches.** Produce trial batches as necessary to obtain a mixture that meets the specification requirements.
- (12) **Trial Batch Sampling.** Obtain a representative sample of the trial batch and split it into three equal portions, in accordance with Tex-222-F. Label these portions as “Contractor,” “Engineer,” and “Referee.” Deliver samples to the appropriate laboratory as directed.
- (13) **Trial Batch Testing.** Test the trial batch to ensure that the mixture produced using the proposed JMF1 meets the mixture requirements in Table 11. The trial batch mixture must also be in compliance with the Hamburg Wheel requirement in Table 10. Use an approved laboratory to perform the Hamburg Wheel test on the trial batch mixture or request that the Department perform the Hamburg Wheel test. The Engineer will be allowed 10 working days to provide the Contractor with Hamburg Wheel

test results on the trial batch. Provide the Engineer with a copy of the trial batch test results.

(14) Development of JMF2. After the Engineer grants full approval of JMF1 based on results from the trial batch, evaluate the trial batch test results, determine the optimum mixture proportions, and submit as JMF2. Adjust the asphalt content or gradation to achieve the specified target laboratory-molded density. The asphalt content established for JMF2 is not required to be within any tolerance of the optimum asphalt content established for JMF1; however, mixture produced using JMF2 must meet the voids in mineral aggregates (VMA) requirements for production shown in Table 8. If the optimum asphalt content for JMF2 is more than 0.5% lower than the optimum asphalt content for JMF1, the Engineer may perform or require the Contractor to perform Tex-226-F on Lot 1 production to confirm the indirect tensile strength does not exceed 200 psi. Verify that JMF2 meets the mixture requirements in Table 5.

(15) Mixture Production. After receiving approval for JMF2 and receiving a passing result from the Department's or a Department-approved laboratory's Hamburg Wheel test on the trial batch, use JMF2 to produce Lot 1 as described in Section 3268.4.I.3.a.(1), "Lot 1 Placement." As an option, once JMF2 is approved, proceed to Lot 1 production at the Contractor's risk without receiving the results from the Department's Hamburg Wheel test on the trial batch.

If electing to proceed without Hamburg Wheel test results from the trial batch, notify the Engineer. Note that the Engineer may require up to the entire subplot of any mixture failing the Hamburg Wheel test to be removed and replaced at the Contractor's expense.

(16) Development of JMF3. Evaluate the test results from Lot 1, determine the optimum mixture proportions, and submit as JMF3 for use in Lot 2.

(17) JMF Adjustments. If necessary, adjust the JMF before beginning a new lot. The adjusted JMF must:

- be provided to the Engineer in writing before the start on a new lot;
- be numbered in sequence to the previous JMF;
- meet the mixture requirements in Table 4 and Table 5;
- meet the master gradation limits shown in Table 8; and
- be within the operational tolerances of JMF2 listed in Table 11.

(18) Requesting Referee Testing. If needed, use referee testing in accordance with Section 3268.4.I.1, "Referee Testing," to resolve testing differences with the Engineer.

**Table 11
Operational Tolerances**

Description	Test Method	Allowable Difference Between Trial Batch and JMF1 Target	Allowable Difference from Current JMF Target	Allowable Difference between Contractor and Engineer ¹
Individual % retained for #8 sieve and larger	Tex-200-F or Tex-236-F	Must be Within Master Grading Limits in Table 8	±5.0 ^{2,3}	±5.0
Individual % retained for sieves smaller than #8 and larger than #200			±3.0 ^{2,3}	±3.0
% passing the #200 sieve			±2.0 ^{2,3}	±1.6
Asphalt content, %	Tex-236-F	±0.5	±0.3 ³	±0.3
Laboratory-molded density, %	Tex-207-F	±1.0	±1.0	±1.0
In-place air voids, %		N/A	N/A	±1.0
Laboratory-molded bulk specific gravity		N/A	N/A	±0.020
VMA, %, min	Tex-204-F	Note 4	Note 4	N/A
Theoretical maximum specific (Rice) gravity	Tex-227-F	N/A	N/A	±0.020

1. Contractor may request referee testing only when values exceed these tolerances.
2. When within these tolerances, mixture production gradations may fall outside the master grading limits; however, the % passing the #200 will be considered out of tolerance when outside the master grading limits.
3. Only applies to mixture produced for Lot 1 and higher.
4. Test and verify that Table 8 requirements are met.

b. Engineer’s Responsibilities.

(1) Gyratory Compactor. For mixtures designed in accordance with Tex-204-F, Part I, the Engineer will use a Department TGC, calibrated in accordance with Tex-914-K, to mold samples for trial batch and production testing. The Engineer will make the Department TGC and the Department field laboratory available to the Contractor for molding verification samples, if requested by the Contractor.

For mixtures designed in accordance with Tex-204-F, Part IV, the Engineer will use a Department SGC, calibrated in accordance with Tex-241-F, to mold samples for laboratory mixture design verification. For molding trial batch and production specimens, the Engineer will use the Contractor-provided SGC at the field laboratory or provide and use a Department SGC at an alternate location. The Engineer will make the Contractor-provided SGC in the Department field laboratory available to the Contractor for molding verification samples.

(2) Conditional Approval of JMF1 and Authorizing Trial Batch. Within 2 working days of receiving the mixture design report (JMF1) and all required materials and Contractor-provided Hamburg Wheel test results, the Engineer will review the Contractor’s mix design report and verify conformance with all aggregates, asphalt, additives, recycled materials, and mixture specifications. The Engineer will grant the Contractor conditional approval of JMF1, if the information provided on the paper copy of JMF1 indicates that the Contractor’s mixture design meets the specifications. When the Contractor does not provide Hamburg Wheel test results with laboratory mixture design, 10 working days is allowed for

conditional approval of JMF 1. The Engineer will base full approval of JMF1 on test results on mixture from the trial batch.

Unless waived, the Engineer will determine the Micro-Deval abrasion loss in accordance with Section 3268.2.A.1.b, "Micro-Deval Abrasion." If the Engineer's test results are pending after 2 working days, conditional approval of JMF1 will still be granted within 2 working days of receiving JMF1. When the Engineer's test results become available, they will be used for specification compliance.

After conditionally approving JMF1, including either Contractor- or Department-supplied Hamburg Wheel test results, the Contractor is authorized to produce a trial batch.

- (3) **Hamburg Wheel Testing of JMF1.** If the Contractor requests the option to have the Department perform the Hamburg Wheel test on the laboratory mixture, the Engineer will mold samples in accordance with Tex-242-F to verify compliance with the Hamburg Wheel test requirement in Table 10.
- (4) **Ignition Oven Correction Factors.** The Engineer will use the split samples provided by the Contractor to determine the aggregate and asphalt correction factors for the ignition oven used for quality assurance testing during production in accordance with Tex-236-F.
- (5) **Testing the Trial Batch.** Within 1 full working day, the Engineer will sample and test the trial batch to ensure that the mixture meets the requirements in Table 11. If the Contractor requests the option to have the Department perform the Hamburg Wheel test on the trial batch mixture, the Engineer will mold samples in accordance with Tex-242-F to verify compliance with the Hamburg Wheel test requirement in Table 10.

The Engineer will have the option to perform the following tests on the trial batch:

- Tex-226-F, to verify that the indirect tensile strength meets the requirement shown in Table 9; and
- Tex-530-C, to retain and use for comparison purposes during production.

- (6) **Full Approval of JMF1.** The Engineer will grant full approval of JMF1 and authorize the Contractor to proceed with developing JMF2 if the Engineer's results for the trial batch meet the requirements in Table 11. The Engineer will notify the Contractor that an additional trial batch is required if the trial batch does not meet these requirements.
- (7) **Approval of JMF2.** The Engineer will approve JMF2 within 1 working day if the mixture meets the requirements in Table 5 and the gradation meets the master grading limits shown in Table 8. The asphalt content established for JMF2 is not required to be within any tolerance of the optimum asphalt content established for JMF1; however, mixture

produced using JMF2 must meet the VMA requirements shown in Table 8. If the optimum asphalt content for JMF2 is more than 0.5% lower than the optimum asphalt content for JMF1, the Engineer may perform or require the Contractor to perform Tex-226-F on Lot 1 production to confirm the indirect tensile strength does not exceed 200 psi.

- (8) Approval of Lot 1 Production.** The Engineer will authorize the Contractor to proceed with Lot 1 production (using JMF2) as soon as a passing result is achieved from the Department's or a Department-approved laboratory's Hamburg Wheel test on the trial batch. The Contractor may proceed at its own risk with Lot 1 production without the results from the Hamburg Wheel test on the trial batch.

If the Department's or Department-approved laboratory's sample from the trial batch fails the Hamburg Wheel test, the Engineer will suspend production until further Hamburg Wheel tests meet the specified values. The Engineer may require up to the entire subplot of any mixture failing the Hamburg Wheel test be removed and replaced at the Contractor's expense.

- (9) Approval of JMF3 and Subsequent JMF Changes.** JMF3 and subsequent JMF changes are approved if they meet the mixture requirements shown in Table 4, Table 5, the master grading limits shown in Table 8, and are within the operational tolerances of JMF2 shown in Table 11.

- E. Production Operations.** Perform a new trial batch when the plant or plant location is changed. Take corrective action and receive approval to proceed after any production suspension for noncompliance to the specification. Submit a new mix design and perform a new trial batch when the asphalt content of:
- either RAP stockpile used in the mix is more than 0.5% higher than the value shown on the mixture design report; or
 - RAS stockpile used in the mix is more than 2.0% higher than the value shown on the mixture design report.
- 1. Storage and Heating of Materials.** Do not heat the asphalt binder above the temperatures specified in Item 300, "Asphalts, Oils, and Emulsions," or outside the manufacturer's recommended values. On a daily basis, provide the Engineer with the records of asphalt binder and hot-mix asphalt discharge temperatures (in legible and discernible increments) in accordance with Item 320, "Equipment for Asphalt Concrete Pavement." Do not store mixture for a period long enough to affect the quality of the mixture, nor in any case longer than 12 hr unless otherwise approved.
- 2. Mixing and Discharge of Materials.** Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. Monitor the temperature of the material in the truck before shipping to ensure that it does not exceed 350°F (or 275°F for WMA) and is not lower than 215°F. The Department will not pay for or allow placement of any mixture produced at more than 350°F.

When WMA is required, produce the WMA within the target temperature discharge range of 215°F and 275°F. Take corrective action any time the discharge temperature of the WMA exceeds the target discharge range. The Engineer may suspend production operations if the Contractor's corrective action is not successful at controlling the production temperature within the target discharge range. Note that when WMA is produced, it may be necessary to adjust burners to ensure complete combustion such that no burner fuel residue remains in the mixture.

Control the mixing time and temperature so that substantially all moisture is removed from the mixture before discharging from the plant. If requested, determine the moisture content by oven-drying in accordance with Tex-212-F, Part II, and verify that the mixture contains no more than 0.2% of moisture by weight. Obtain the sample immediately after discharging the mixture into the truck, and perform the test promptly.

- F. Hauling Operations.** Before use, clean all truck beds to ensure that mixture is not contaminated. When a release agent is necessary, use a release agent on the Department's Material Producer List to coat the inside bed of the truck.

Use only equipment for hauling as defined in Section 3268.4.G.3.c, "Hauling Equipment." Other hauling equipment may be used when allowed by the Engineer.

- G. Placement Operations.** Collect haul tickets from each load of mixture delivered to the project and provide the Department's copy to the Engineer approximately every hour, or as directed by the Engineer. When the Pave-IR system is not used for specification compliance, use a non-contact infrared thermometer to measure and record the internal temperature of the mixture as discharged from the truck or material transfer device prior to or as the mix enters the paver and an approximate station number or GPS coordinates on each ticket. Calculate the daily yield and cumulative yield for the specified lift and provide to the Engineer at the end of paving operations for each day unless otherwise directed. The Engineer may suspend production if the Contractor fails to produce and provide haul tickets and yield calculations by the end of paving operations for each day.

Prepare the surface by removing raised pavement markers and objectionable material such as moisture, dirt, sand, leaves, and other loose impediments from the surface before placing mixture. Remove vegetation from pavement edges. Place the mixture to meet the typical section requirements and produce a smooth, finished surface with a uniform appearance and texture. Offset longitudinal joints of successive courses of hot mix by at least 6 in. Place mixture so that longitudinal joints on the surface course coincide with lane lines, or as directed. Ensure that all finished surfaces will drain properly. Place the mixture at the rate or thickness shown on the plans. The Engineer will use the guidelines in Table 12 to determine the compacted lift thickness of each layer when multiple lifts are required. The thickness determined is based on the rate of 110 lb./sq. yd. for each inch of pavement unless otherwise shown on the plans.

**Table 12
Compacted Lift Thickness and Required Core Height**

Mixture Type	Compacted Lift Thickness Guidelines		Minimum Untrimmed Core Height (in.) Eligible for Testing
	Minimum (in.)	Maximum (in.)	
A	3.00	6.00	2.00
B	2.50	5.00	1.75
C	2.00	4.00	1.50
D	1.50	3.00	1.25
F	1.25	2.50	1.25

1. Weather Conditions.

- a. When Using a Pave-IR System for Specification Compliance.** The Contractor may pave any time the roadway is dry and the roadway surface temperature is at least 32°F; however, the Engineer may restrict the Contractor from paving surface mixtures if the ambient temperature is likely to drop below 32°F within 12 hours of paving. Operate the Pave-IR system in accordance with Tex-244-F and demonstrate to the Engineer that no recurring severe thermal segregation exists. Provide the Engineer with the automated report described in Tex-244-F on a daily basis unless otherwise directed.

- b. When Not Using a Pave-IR System for Specification Compliance.** Place mixture when the roadway surface temperature is equal to or higher than the temperatures listed in Table 13 unless otherwise approved or as shown on the plans. Measure the roadway surface temperature with a handheld infrared thermometer. The Engineer may allow mixture placement to begin prior to the roadway surface reaching the required temperature requirements, if conditions are such that the roadway surface will reach the required temperature within 2 hours of beginning placement operations. Place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable in the opinion of the Engineer. The Engineer may restrict the Contractor from paving if the ambient temperature is likely to drop below 32°F within 12 hours of paving.

**Table 13
Minimum Pavement Surface Temperatures**

Originally Specified High Temperature Binder Grade	Minimum Pavement Surface Temperatures in Degrees Fahrenheit	
	Subsurface Layers or Night Paving Operations	Surface Layers Placed in Daylight Operations
PG 64 or lower	45	50
PG 70	55 ¹	60 ¹
PG 76 or higher	60 ¹	60 ¹

1. Contractors may pave at temperatures 10°F lower than these values when utilizing a paving process including WMA or equipment that eliminates thermal segregation. In such cases, the Contractor must use either a hand held thermal camera or a hand held infrared thermometer operated in accordance with Tex-244-F to demonstrate to the satisfaction of the Engineer that the uncompacted mat has no more than 10°F of thermal segregation.

2. **Tack Coat.** Clean the surface before placing the tack coat. Unless otherwise approved, apply tack coat uniformly at the rate directed by the Engineer. The Engineer will set the rate between 0.04 and 0.10 gal. of residual asphalt per square yard of surface area. Apply the tack coat in a uniform manner to avoid streaks and other irregular patterns. Apply a thin, uniform tack coat to all contact surfaces of curbs, structures, and all joints. Allow adequate time for emulsion to break completely prior to placing any material. Prevent splattering of tack coat when placed adjacent to curb, gutter, and structures. Roll the tack coat with a pneumatic-tire roller to remove streaks and other irregular patterns when directed.

3. **Lay-Down Operations.**

a. **Thermal Profile.** Use a thermal camera or an infrared thermometer to obtain thermal profiles on each subplot in accordance with Tex-244-F. When the Pave-IR system is not used for specification compliance, the Engineer will obtain a thermal profile at least once per project. Thermal profiles are not applicable in areas described in Section 3268.4.I.3.a(4), "Miscellaneous Areas."

Within 1 working day of the completion of each lot, provide the Engineer with the thermal profile of every subplot within the lot. Report the results of each thermal profile in accordance with Section 3268.4.B, "Reporting and Responsibilities."

(1) **Moderate Thermal Segregation.** Any areas that have a temperature differential greater than 25°F but not exceeding 50°F are deemed as having moderate thermal segregation. Take immediate corrective action to eliminate the moderate thermal segregation. Evaluate areas with moderate thermal segregation by performing density profiles in accordance with Section 3268.4.I.3.c(2), "Segregation (Density Profile)."

(2) **Severe Thermal Segregation.** Any areas that have a temperature differential greater than 50°F are deemed as having severe thermal segregation. When the Pave-IR system is not used for specification compliance, no production or placement bonus will be paid for any subplot that contains severe thermal segregation. Suspend operations and take immediate corrective action to eliminate severe thermal segregation unless otherwise directed. Resume operations when the Engineer determines that subsequent production will meet the requirements of this Section. Evaluate areas with severe thermal segregation by performing density profiles in accordance with Section 3268.4.I.3.c(2), "Segregation (Density Profile)." Remove and replace the material in any areas that have both severe thermal segregation and a failing result for Segregation (Density Profile) unless otherwise directed. The subplot in question may receive a production and placement bonus if applicable when the defective material is successfully removed and replaced.

(3) **Use of the Pave-IR System.** In lieu of obtaining thermal profiles on each subplot using a thermal camera or an infrared thermometer, the Contractor

may use the Pave-IR system (paver mounted infrared bar) to obtain a continuous thermal profile in accordance with Tex-244-F. When electing to use the Pave-IR system, notify the Engineer prior to beginning placement operations and specify if using the Pave-IR system for specification compliance or for information only. When electing to use the Pave-IR system for information only, use a thermal camera or an infrared thermometer to obtain thermal profiles in accordance with Tex-244-F. When electing to use the Pave-IR system for information only, segregation density profiles are applicable.

When using the Pave-IR system for specification compliance, review the output results on a daily basis. Unless otherwise directed, provide the automated report described in Tex-244-F to the Engineer for review. Modify the paving process as necessary to eliminate any recurring (moderate or severe) thermal segregation identified by the Pave-IR system. The Engineer may suspend paving operations if the Contractor cannot successfully modify the paving process to eliminate recurring severe thermal segregation. Density profiles are not required and are not applicable when using the Pave-IR system for specification compliance. Upon completion of use of the Pave-IR system for specification compliance or as requested by the Engineer, provide the Engineer with electronic copies of all daily data files that can be used with the Pave-IR system software to generate temperature profile plots.

- b. Windrow Operations.** When hot mix is placed in windrows, operate windrow pickup equipment so that substantially all the mixture deposited on the roadbed is picked up and loaded into the paver.
 - c. Hauling Equipment.** The Contractor may elect to use belly dumps, live bottom, or end dump trucks to haul and transfer mixture; however, with exception of paving miscellaneous areas, end dump trucks are only allowed when used in conjunction with an MTD with remixing capability or when a Pave-IR system is used for specification compliance unless otherwise allowed by the Engineer.
 - d. Screed Heaters.** If the paver stops for more than 5 minutes, turn off screed heaters to prevent overheating of the mat. If the screed heater remains on for more than 5 minutes while the paver is stopped, the Engineer may evaluate the suspect area in accordance with Section 3268.4.I.3.c(4), "Recovered Asphalt Dynamic Shear Rheometer (DSR)."
- H. Compaction.** Uniformly compact the pavement to contain between 3.8% and 8.5% in-place air voids. When the in-place air voids exceed the range of 3.8% and 8.5%, take immediate corrective action to bring the operation within these tolerances. Areas defined in Section 3268.4.I.3.a(4), "Miscellaneous Areas," are not subject to in-place air void determination. In all other areas, the Engineer may obtain and test cores and may suspend operations or require removal and replacement if the in-place air voids are less than 2.7% or greater than 9.9%. The Engineer will allow paving to resume when the proposed corrective action is likely to yield between 3.8% and 8.5% in-place air voids.

Furnish the type, size, and number of rollers required for compaction as approved. Use a pneumatic-tire roller to seal the surface unless excessive pickup of fines occurs. Use additional rollers as required to remove any roller marks. Use only water or an approved release agent on rollers, tamps, and other compaction equipment unless otherwise directed.

On the first day of production, use the control strip method given in Tex-207-F, Part IV, to establish the rolling pattern that will produce the desired in-place air voids unless otherwise directed.

Use tamps to thoroughly compact the edges of the pavement along curbs, headers, and similar structures and in locations that will not allow thorough compaction with rollers. The Engineer may require rolling with a trench roller on widened areas, in trenches, and in other limited areas.

Complete all compaction operations before the pavement temperature drops below 160°F unless otherwise allowed. The Engineer may allow compaction with a light finish roller operated in static mode for pavement temperatures below 160°F.

Allow the compacted pavement to cool to 160°F or lower before opening to traffic unless otherwise directed. When directed, sprinkle the finished mat with water or limewater to expedite opening the roadway to traffic.

I. Acceptance Plan. Pay adjustments for the material will be in accordance with Article 3268.6, "Payment."

Sample and test the hot mix on a lot and subplot basis. If the production pay factor given in Section 3268.6.A, "Production Pay Adjustment Factors," for two consecutive lots or the placement pay factor given in Section 3268.6.B, "Placement Pay Adjustment Factors," for two consecutive lots is below 1.000, suspend production until test results or other information indicates to the satisfaction of the Engineer that the next material produced or placed will result in pay factors of at least 1.000.

- 1. Referee Testing.** The Construction Division is the referee laboratory. The Contractor may request referee testing if a "remove and replace" condition is determined based on the Engineer's test results, or if the differences between Contractor and Engineer test results exceed the maximum allowable difference shown in Table 11 and the differences cannot be resolved. The Contractor may also request referee testing if the Engineer's test results require suspension of production and the Contractor's test results are within specification limits. Make the request within 5 working days after receiving test results and cores from the Engineer. Referee tests will be performed only on the subplot in question and only for the particular tests in question. Allow 10 working days from the time the samples are received at the referee laboratory for test results to be reported. The Department may require the Contractor to reimburse the Department for referee tests if more than three referee tests per project are required and the Engineer's test results are closer than the Contractor's test results to the referee test results.

The Construction Division will determine the laboratory-molded density based on the molded specific gravity and the maximum theoretical specific gravity of the

referee sample. The in-place air voids will be determined based on the bulk specific gravity of the cores, as determined by the referee laboratory and the Engineer's average maximum theoretical specific gravity for the lot. With the exception of "remove and replace" conditions, referee test results are final and will establish pay adjustment factors for the subplot in question. The Contractor may decline referee testing and accept the Engineer's test results when the placement pay adjustment factor for any subplot results in a "remove and replace" condition. Placement sublots subject to be removed and replaced will be further evaluated in accordance with Section 3268.6.B.2, "Placement Sublots Subject to Removal and Replacement."

2. **Production Acceptance.**

- a. **Production Lot.** A production lot consists of four equal sublots. The default quantity for Lot 1 is 1,000 tons; however, when requested by the Contractor, the Engineer may increase the quantity for Lot 1 to no more than 4,000 tons. The Engineer will select subsequent lot sizes based on the anticipated daily production such that approximately three to four sublots are produced each day. The lot size will be between 1,000 tons and 4,000 tons. The Engineer may change the lot size before the Contractor begins any lot.

If the optimum asphalt content for JMF2 is more than 0.5% lower than the optimum asphalt content for JMF1, the Engineer may perform or require the Contractor to perform Tex-226-F on Lot 1 to confirm the indirect tensile strength does not exceed 200 psi. If the indirect tensile strength exceeds 200 psi, take corrective action to bring the mixture within specification compliance unless otherwise directed.

- (1) **Incomplete Production Lots.** If a lot is begun but cannot be completed, such as on the last day of production or in other circumstances deemed appropriate, the Engineer may close the lot. Adjust the payment for the incomplete lot in accordance with Section 3268.6.A, "Production Pay Adjustment Factors." Close all lots within 5 working days unless otherwise allowed by the Engineer.

b. **Production Sampling.**

- (1) **Mixture Sampling.** Obtain hot mix samples from trucks at the plant in accordance with Tex-222-F. The sampler will split each sample into three equal portions in accordance with Tex-200-F and label these portions as "Contractor," "Engineer," and "Referee." The Engineer will perform or witness the sample splitting and take immediate possession of the samples labeled "Engineer" and "Referee." The Engineer will maintain the custody of the samples labeled "Engineer" and "Referee" until the Department's testing is completed.

- (a) **Random Sample.** At the beginning of the project, the Engineer will select random numbers for all production sublots. Determine sample locations in accordance with Tex-225-F. For each subplot, take one

sample at the location randomly selected. The Engineer will perform or witness the sampling of production sublots.

(b) Blind Sample. For one subplot per lot, the Engineer will obtain and test a “blind” sample in lieu of the random sample collected by the Contractor. The Contractor may test either the “blind” or the random sample; however, referee testing (if applicable) will be based on a comparison of results from the “blind” sample. The location of the Engineer’s “blind” sample will not be disclosed to the Contractor. The Engineer’s “blind” sample may be randomly selected in accordance with Tex-225-F for any subplot or selected at the discretion of the Engineer. The Engineer will use the Contractor’s split sample for sublots not sampled by the Engineer.

(2) Informational Cantabro and Overlay Testing. During the first week of production, randomly select one subplot from Lot 2 or higher for Cantabro and Overlay testing. Obtain and provide the Engineer with approximately 150 lb. (70 kg) of mixture in sealed containers, boxes, or bags labeled with CSJ, mixture type, lot, and subplot number. The Engineer will ship the mixture to the Construction Division for Cantabro and Overlay testing. Results from these tests will not be used for specification compliance.

(3) Asphalt Binder Sampling. Obtain a 1 qt. sample of the asphalt binder for each lot of mixture produced. Obtain the sample at approximately the same time the mixture random sample is obtained. Sample from a port located immediately upstream from the mixing drum or pug mill in accordance with Tex-500-C, Part II. Label the can with the corresponding lot and subplot numbers and deliver the sample to the Engineer. The Engineer may also obtain independent samples. If obtaining an independent asphalt binder sample, the Engineer will split a sample of the asphalt binder with the Contractor. The Engineer will test at least one asphalt binder sample per project to verify compliance with Item 300, “Asphalts, Oils, and Emulsions.”

c. Production Testing. The Contractor and Engineer must perform production tests in accordance with Table 14. The Contractor has the option to verify the Engineer’s test results on split samples provided by the Engineer. Determine compliance with operational tolerances listed in Table 11 for all sublots.

If the Engineer’s laboratory-molded density on any subplot is less than 95.0% or greater than 98.0%, take immediate corrective action to bring the mixture within these tolerances. The Engineer may suspend operations if the Contractor’s corrective actions do not produce acceptable results. The Engineer will allow production to resume when the proposed corrective action is likely to yield acceptable results.

If the aggregate mineralogy is such that Tex-236-F does not yield reliable results, the Engineer may allow alternate methods for determining the asphalt content and aggregate gradation. Provide evidence that results from Tex-236-F

are not reliable before requesting permission to use an alternate method unless otherwise directed. If an alternate test method is allowed, use the applicable test procedure as directed.

**Table 14
Production and Placement Testing Frequency**

Description	Test Method	Minimum Contractor Testing Frequency	Minimum Engineer Testing Frequency ¹
Individual % retained for #8 sieve and larger	Tex-200-F or Tex-236-F	1 per subplot	1 per 12 sublots
Individual % retained for sieves smaller than #8 and larger than #200			
% passing the #200 sieve			
Laboratory-molded density	Tex-207-F	N/A	1 per subplot
Laboratory-molded bulk specific gravity			
In-place air voids			
VMA	Tex-204-F		
Segregation (density profile) ⁵	Tex-207-F, Part V	1 per subplot	1 per project
Longitudinal joint density	Tex-207-F, Part VII		
Moisture content	Tex-212-F, Part II	When directed	
Theoretical maximum specific (Rice) gravity	Tex-227-F	N/A	1 per subplot
Asphalt content	Tex-236-F	1 per subplot	1 per lot
Hamburg Wheel test	Tex-242-F	N/A	1 per project
Recycled Asphalt Shingles (RAS) ²	Tex-217-F, Part III	N/A	
Thermal profile ⁵	Tex-244-F	1 per subplot	
Asphalt binder sampling and testing	Tex-500-C	1 per lot (sample only)	
Tack coat sampling and testing	Tex-500-C, Part III	N/A	
Boil test ³	Tex-530-C	1 per lot	
Cantabro loss ⁴	Tex-245-F	1 per project (sample only)	
Overlay test ⁴	Tex-248-F		

1. For production defined in Section 3268.I.4, "Exempt Production," the Engineer will test at the frequency listed in the Department's *Guide Schedule of Sampling and Testing* and this specification.

2. Testing performed by the Construction Division or designated laboratory.

3. The Engineer may reduce or waive the sampling and testing requirements based on a satisfactory test history.

4. Testing performed by the Construction Division and for informational purposes only.

5. Not required when the Pave-IR system is used for specification compliance.

d. Operational Tolerances. Control the production process within the operational tolerances listed in Table 11. When production is suspended, the Engineer will allow production to resume when test results or other information indicates that the next mixture produced will be within the operational tolerances.

(1) Gradation. Suspend operation and take corrective action if any aggregate is retained on the maximum sieve size shown in Table 8. A subplot is defined as out of tolerance if either the Engineer's or the Contractor's test results are out of operational tolerance. Unless otherwise directed, suspend production when test results for gradation exceed the operational tolerances for three consecutive sublots on the same sieve or four consecutive sublots on any sieve. The consecutive sublots may be from more than one lot.

- (2) **Asphalt Content.** A subplot is defined as out of operational tolerance if either the Engineer's or the Contractor's test results exceed the values listed in Table 11. No production or placement bonus will be paid for any subplot that is out of operational tolerance for asphalt content. Suspend production and shipment of the mixture if the Engineer's or the Contractor's asphalt content deviates from the current JMF by more than 0.5% for any subplot.
- (3) **Voids in Mineral Aggregates (VMA).** The Engineer will determine the VMA for every subplot. For sublots when the Engineer does not determine asphalt content, the Engineer will use the asphalt content results from quality control testing performed by the Contractor to determine VMA.

Take immediate corrective action if the VMA value for any subplot is less than the minimum VMA requirement for production listed in Table 8. Suspend production and shipment of the mixture if the Engineer's VMA results on two consecutive sublots are below the minimum VMA requirement for production listed in Table 8. No production or placement bonus will be paid for any subplot that does not meet the minimum VMA requirement for production listed in Table 8 based on the Engineer's VMA determination.

Suspend production and shipment of the mixture if the Engineer's VMA result is more than 0.5% below the minimum VMA requirement for production listed in Table 8. In addition to suspending production, the Engineer may require removal and replacement or may allow the subplot to be left in place without payment.

- (4) **Hamburg Wheel Test.** The Engineer may perform a Hamburg Wheel test at any time during production, including when the boil test indicates a change in quality from the materials submitted for JMF1. In addition to testing production samples, the Engineer may obtain cores and perform Hamburg Wheel tests on any areas of the roadway where rutting is observed. When the production or core samples fail the Hamburg Wheel test criteria in Table 10, suspend production until further Hamburg Wheel tests meet the specified values. Core samples, if taken, will be obtained from the center of the finished mat or other areas excluding the vehicle wheel paths. The Engineer may require up to the entire subplot of any mixture failing the Hamburg Wheel test to be removed and replaced at the Contractor's expense.

If the Department's or approved laboratory's Hamburg Wheel test results in a "remove and replace" condition, the Contractor may request that the Department confirm the results by retesting the failing material. The Construction Division will perform the Hamburg Wheel tests and determine the final disposition of the material in question based on the Department's test results.

- e. **Individual Loads of Hot Mix.** The Engineer can reject individual truckloads of hot mix. When a load of hot mix is rejected for reasons other than temperature, contamination, or excessive uncoated particles, the Contractor may request that the rejected load be tested. Make this request within 4 hr. of rejection. The Engineer will sample and test the mixture. If test results are within the operational tolerances shown in Table 11, payment will be made for the load. If test results are not within operational tolerances, no payment will be made for the load and the Engineer may require removal.

3. Placement Acceptance.

- a. **Placement Lot.** A placement lot consists of four placement sublots. A placement subplot consists of the area placed during a production subplot.
 - (1) **Lot 1 Placement.** Placement bonuses for Lot 1 will be in accordance with Section 3268.6.B, "Placement Pay Adjustment Factors;" however, no placement penalty will be assessed for any subplot placed in Lot 1 when the in-place air voids are greater than or equal to 2.7% and less than or equal to 9.9%. Remove and replace any subplot with in-place air voids less than 2.7% or greater than 9.9%.
 - (2) **Incomplete Placement Lots.** An incomplete placement lot consists of the area placed as described in Section 3268.4.I.2.a(1), "Incomplete Production Lots," excluding areas defined in Section 3268.4.I.3.a(4), "Miscellaneous Areas." Placement sampling is required if the random sample plan for production resulted in a sample being obtained from an incomplete production subplot.
 - (3) **Shoulders, Ramps, Etc.** Shoulders, ramps, intersections, acceleration lanes, deceleration lanes, and turn lanes are subject to in-place air void determination unless designated on the plans as not eligible for in-place air void determination. Intersections may be considered miscellaneous areas when determined by the Engineer.
 - (4) **Miscellaneous Areas.** Miscellaneous areas include areas that typically involve significant handwork or discontinuous paving operations, such as temporary detours, driveways, mailbox turnouts, crossovers, gores, spot level-up areas, and other similar areas. Temporary detours are subject to in-place air void determination when shown on the plans. Miscellaneous areas also include level-ups and thin overlays when the layer thickness specified on the plans is less than the minimum untrimmed core height eligible for testing shown in Table 12. The specified layer thickness is based on the rate of 110 lb./sq. yd. for each inch of pavement unless another rate is shown on the plans. Miscellaneous areas are not eligible for random placement sampling locations. Compact miscellaneous areas in accordance with Section 3268.4.H, "Compaction." Miscellaneous areas are not subject to in-place air void determination, thermal profiles testing, segregation (density profiles), or longitudinal joint density evaluations.

- b. Placement Sampling.** At the beginning of the project, the Engineer will select random numbers for all placement sublots. The Engineer will provide the Contractor with the placement random numbers immediately after the subplot is completed. Mark the roadway location at the completion of each subplot and record the station number. Determine one random sample location for each placement subplot in accordance with Tex-225-F. If the randomly generated sample location is within 2 ft. of a joint or pavement edge, adjust the location by no more than necessary to achieve a 2-ft. clearance.

Shoulders, ramps, intersections, acceleration lanes, deceleration lanes, and turn lanes are always eligible for selection as a random sample location; however, if a random sample location falls on one of these areas and the area is designated on the plans as not subject to in-place air void determination, cores will not be taken for the subplot and a 1.000 pay factor will be assigned to that subplot.

Provide the equipment and means to obtain and trim roadway cores on site. On site is defined as in close proximity to where the cores are taken. Obtain the cores within 1 working day of the time the placement subplot is completed unless otherwise approved. Obtain two 6-in. diameter cores side-by-side from within 1 ft. of the random location provided for the placement subplot. For Type D and Type F mixtures, 4-in. diameter cores are allowed. Mark the cores for identification, measure and record the untrimmed core height, and provide the information to the Engineer. The Engineer will witness the coring operation and measurement of the core thickness. Visually inspect each core and verify that the current paving layer is bonded to the underlying layer. If an adequate bond does not exist between the current and underlying layer, take corrective action to ensure that an adequate bond will be achieved during subsequent placement operations.

Immediately after obtaining the cores from the roadway, trim the cores in accordance with Tex-207-F if the core heights meet the minimum untrimmed values listed in Table 12. Trim the cores on site in the presence of the Engineer. Use a permanent marker or paint pen to record the lot and subplot numbers on each core as well as the designation as Core A or B. The Engineer may require additional information to be marked on the core and may choose to sign or initial the core. The Engineer will take custody of the cores immediately after they are trimmed and will retain custody of the cores until the Department's testing is completed. Prior to turning the trimmed cores over to the Engineer, the Contractor may elect to wrap the trimmed cores or secure them in a manner that will reduce the risk of possible damage occurring during transport by the Engineer. After testing, the Engineer will return the cores to the Contractor.

The Engineer may elect to have the cores transported back to the Department's laboratory at the HMA plant via the Contractor's haul truck or other designated vehicle. In such cases where the cores will be out of the Engineer's possession during transport, the Engineer will use the Construction Division's protocol to provide a secure means and process that protects the integrity of the cores during transport.

If the core height before trimming is less than the minimum untrimmed value shown in Table 12, decide whether to include the pair of cores in the air void determination for that subplot. If electing to have the cores included in air void determination, trim the cores as described above before delivering to the Engineer. If electing to not have the cores included in air void determination, deliver untrimmed cores to the Engineer and inform the Engineer of the decision to not have the cores included in air void determination. The placement pay factor for the subplot will be 1.000 if cores will not be included in air void determination.

In lieu of the Contractor trimming the cores on site immediately after coring, the Engineer and the Contractor may mutually agree to have the trimming operations performed at an alternate location such as a field laboratory or other similar location. In such cases, the Engineer will take possession of the cores immediately after they are obtained from the roadway and will retain custody of the cores until testing is completed. Either the Department or Contractor representative may perform trimming of the cores. The Engineer will witness all trimming operations in cases where the Contractor representative performs the trimming operation.

Immediately after obtaining the cores, dry the core holes and tack the sides and bottom. Fill the hole with the same type of mixture and properly compact the mixture. Repair core holes with other methods when approved.

- c. **Placement Testing.** Perform placement tests in accordance with Table 14. After the Engineer returns the cores, the Contractor has the option to test the cores to verify the Engineer's test results for in-place air voids. The allowable differences between the Contractor's and Engineer's test results are listed in Table 11.

- (1) **In-Place Air Voids.** The Engineer will measure in-place air voids in accordance with Tex-207-F and Tex-227-F. Before drying to a constant weight, cores may be pre-dried using a Corelok or similar vacuum device to remove excess moisture. The Engineer will average the values obtained for all sublots in the production lot to determine the theoretical maximum specific gravity. The Engineer will use the average air void content for in-place air voids.

The Engineer will use the vacuum method to seal the core if required by Tex-207-F. The Engineer will use the test results from the unsealed core to determine the placement pay adjustment factor if the sealed core yields a higher specific gravity than the unsealed core. After determining the in-place air void content, the Engineer will return the cores and provide test results to the Contractor.

- (2) **Segregation (Density Profile).** Test for segregation using density profiles in accordance with Tex-207-F, Part V. Density profiles are not required and are not applicable when using the Pave-IR system for specification

compliance. Density profiles are not applicable in areas described in Section 3268.4.I.3.a(4), “Miscellaneous Areas.”

Unless otherwise approved, perform a density profile every time the paver stops for more than 60 seconds, on areas that are identified by either the Contractor or the Engineer as having thermal segregation, and on any visibly segregated areas. If the paver does not stop for more than 60 seconds, and there are no visibly segregated areas or areas that are identified as having thermal segregation, perform a minimum of one profile per subplot.

Within 1 working day of the completion of each lot, provide the Engineer with the density profile of every subplot within the lot. Report the results of each density profile in accordance with Section 3268.4.B, “Reporting and Responsibilities.”

The density profile is considered failing if it exceeds the tolerances in Table 15. No production or placement bonus will be paid for any subplot that contains a failing density profile. When the Pave-IR system is not used for specification compliance, the Engineer will measure the density profile at least once per project. The Engineer’s density profile results will be used when available. The Engineer may require the Contractor to remove and replace the area in question if the area fails the density profile and has surface irregularities as defined in Section 3268.4.I.3.c(5), “Irregularities.” The subplot in question may receive a production and placement bonus if applicable when the defective material is successfully removed and replaced.

Investigate density profile failures and take corrective actions during production and placement to eliminate the segregation. Suspend production if two consecutive density profiles fail unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

Table 15
Segregation (Density Profile) Acceptance Criteria

Mixture Type	Maximum Allowable Density Range (Highest to Lowest)	Maximum Allowable Density Range (Average to Lowest)
Type A & Type B	8.0 pcf	5.0 pcf
Type C, Type D & Type F	6.0 pcf	3.0 pcf

(3) Longitudinal Joint Density.

(a) Informational Tests. While establishing the rolling pattern, perform joint density evaluations, and verify that the joint density is no more than 3.0 pcf below the density taken at or near the center of the mat. Adjust the rolling pattern, if needed, to achieve the desired joint density. Perform additional joint density evaluations at least once per subplot unless otherwise directed.

(b) Record Tests. For each subplot, perform a joint density evaluation at each pavement edge that is or will become a longitudinal joint. Joint density evaluations are not applicable in areas described in Section 3268.4.I.3.a(4), “Miscellaneous Areas.” Determine the joint density in accordance with Tex-207-F, Part VII. Record the joint density information and submit results on Department forms to the Engineer. The evaluation is considered failing if the joint density is more than 3.0 pcf below the density taken at the core random sample location and the correlated joint density is less than 90.0%. The Engineer will make an independent joint density verification at least once per project and may make independent joint density verifications at the random sample locations. The Engineer’s joint density test results will be used when available.

Within 1 working day of the completion of each lot, provide the Engineer with the joint density of every subplot within the lot. Report the results of each joint density in accordance with Section 3268.4.B, “Reporting and Responsibilities.”

Investigate joint density failures and take corrective actions during production and placement to improve the joint density. Suspend production if the evaluations on two consecutive sublots fail unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

(4) Recovered Asphalt Dynamic Shear Rheometer (DSR). When the Pave-IR system is not used for specification compliance, the Engineer may take production samples or cores from suspect areas of the project to determine recovered asphalt properties. Asphalt binders with an aging ratio greater than 3.5 do not meet the requirements for recovered asphalt properties and may be deemed defective when tested and evaluated by the Construction Division. The aging ratio is the DSR value of the extracted binder divided by the DSR value of the original unaged binder. Obtain DSR values in accordance with AASHTO T 315 at the specified high temperature performance grade of the asphalt. The Engineer may require removal and replacement of the defective material at the Contractor’s expense. The asphalt binder will be recovered for testing from production samples or cores in accordance with Tex-211-F.

(5) Irregularities. Identify and correct irregularities including but not limited to segregation, rutting, raveling, flushing, fat spots, mat slippage, irregular color, irregular texture, roller marks, tears, gouges, streaks, uncoated aggregate particles, or broken aggregate particles. The Engineer may also identify irregularities, and in such cases, the Engineer will promptly notify the Contractor. If the Engineer determines that the irregularity will adversely affect pavement performance, the Engineer may require the Contractor to remove and replace (at the Contractor’s expense) areas of the pavement that contain irregularities and areas where the mixture does not bond to the existing pavement.

If irregularities are detected, the Engineer may require the Contractor to immediately suspend operations or may allow the Contractor to continue operations for no more than 1 day while the Contractor is taking appropriate corrective action.

4. **Exempt Production.** When the anticipated daily production is less than 1,000 tons, the total production for the project is less than 5,000 tons, or when mutually agreed between the Engineer and the Contractor, the Engineer may deem the mixture as exempt production. Production may also be exempt when shown on the plans.

For exempt production, the Contractor is relieved of all production and placement sampling and testing requirements, and the production and placement pay factors are 1.000. All other specification requirements apply, and the Engineer will perform acceptance tests for production and placement listed in Table 14 at the frequency listed in the Department's *Guide Schedule of Sampling and Testing*.

For exempt production:

- produce, haul, place, and compact the mixture in compliance with the specification and as directed by the Engineer;
- control mixture production to yield a laboratory-molded density that is within $\pm 1.0\%$ of the target laboratory-molded density as tested by the Engineer;
- compact the mixture in accordance with Section 3268.4.H, "Compaction"; and
- when the Contractor elects not to use the Pave-IR system for specification compliance, the Engineer may perform segregation (density profiles) and thermal profiles in accordance with the specification.

5. **Ride Quality.** Measure ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces," unless otherwise shown on the plans.

5. **Measurement.** Hot mix will be measured by the ton of composite hot mix, which includes asphalt, aggregate, and additives. Measure the weight on scales in accordance with Item 520, "Weighing and Measuring Equipment."

6. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under Article 3268.5, "Measurement," will be paid for at the unit price bid for "Dense Graded Hot-Mix Asphalt" of the type, surface aggregate classification, and binder specified. These prices are full compensation for surface preparation; materials including tack coat; placement; equipment; labor; tools; and incidentals.

Pay adjustments for bonuses and penalties will be applied as determined in this Item; however, a pay adjustment factor of 1.000 will be assigned for all placement sublots for "level ups" only when "level up" is listed as part of the item bid description code. A pay adjustment factor of 1.000 will be assigned to all production and placement sublots when "exempt" is listed as part of the item bid description code.

Applicable pay adjustment bonuses will only be paid for sublots when the Contractor supplies the Engineer with the required documentation for production and placement QC/QA, thermal profiles, segregation density profiles, and longitudinal joint density in accordance with Section 3268.4.B, “Reporting and Responsibilities.” If the Contractor uses the Pave-IR system for specification compliance, documentation is not required for thermal profiles or segregation density profiles on individual sublots; however, the Pave-IR system automated reports described in Tex-244-F are required.

Trial batches will not be paid for unless they are included in pavement work approved by the Department.

Pay adjustment for ride quality will be determined in accordance with Item 585, “Ride Quality for Pavement Surfaces.”

A. Production Pay Adjustment Factors. The production pay adjustment factor is based on the laboratory-molded density using the Engineer’s test results. A pay adjustment factor will be determined from Table 16 for each subplot using the deviation from the target laboratory-molded density defined in Table 9. The production pay adjustment factor for completed lots will be the average of the pay adjustment factors for the four sublots sampled within that lot.

**Table 16
Production Pay Adjustment Factors for Laboratory-Molded Density¹**

Absolute Deviation from Target Laboratory-Molded Density	Production Pay Adjustment Factor (Target Laboratory-Molded Density)
0.0	1.050
0.1	1.050
0.2	1.050
0.3	1.044
0.4	1.038
0.5	1.031
0.6	1.025
0.7	1.019
0.8	1.013
0.9	1.006
1.0	1.000
1.1	0.965
1.2	0.930
1.3	0.895
1.4	0.860
1.5	0.825
1.6	0.790
1.7	0.755
1.8	0.720
> 1.8	Remove and replace

1. If the Engineer’s laboratory-molded density on any subplot is less than 95.0% or greater than 98.0%, take immediate corrective action to bring the mixture within these tolerances. The Engineer may suspend operations if the Contractor’s corrective actions do not produce acceptable results. The Engineer will allow production to resume when the proposed corrective action is likely to yield acceptable results.

1. Payment for Incomplete Production Lots. Production pay adjustments for incomplete lots, described under Section 3268.4.1.2.a(1), “Incomplete Production Lots,” will be calculated using the average production pay factors from all sublots

sampled. A production pay factor of 1.000 will be assigned to any lot when the random sampling plan did not result in collection of any samples.

2. **Production Sublots Subject to Removal and Replacement.** If after referee testing, the laboratory-molded density for any subplot results in a “remove and replace” condition as listed in Table 16, the Engineer may require removal and replacement, or may allow the subplot to be left in place without payment. The Engineer may also elect to accept the subplot in accordance with Item 5, “Control of the Work,” Section 5.3.A, “Acceptance of Defective or Unauthorized Work.” Replacement material meeting the requirements of this Item will be paid for in accordance with this Section.

- B. **Placement Pay Adjustment Factors.** The placement pay adjustment factor is based on in-place air voids using the Engineer’s test results. A pay adjustment factor will be determined from Table 17 for each subplot that requires in-place air void measurement. A placement pay adjustment factor of 1.000 will be assigned to the entire subplot when the random sample location falls in an area designated on the plans as not subject to in-place air void determination. A placement pay adjustment factor of 1.000 will be assigned to quantities placed in areas described in Section 3268.4.I.3.a(4), “Miscellaneous Areas.” The placement pay adjustment factor for completed lots will be the average of the placement pay adjustment factors for up to four sublots within that lot.

**Table 17
Placement Pay Adjustment Factors for In-place Air Voids**

In-place Air Voids	Placement Pay Adjustment Factor	In-place Air Voids	Placement Pay Adjustment Factor
< 2.7	Remove and Replace	6.4	1.042
2.7	0.710	6.5	1.040
2.8	0.740	6.6	1.038
2.9	0.770	6.7	1.036
3.0	0.800	6.8	1.034
3.1	0.830	6.9	1.032
3.2	0.860	7.0	1.030
3.3	0.890	7.1	1.028
3.4	0.920	7.2	1.026
3.5	0.950	7.3	1.024
3.6	0.980	7.4	1.022
3.7	0.998	7.5	1.020
3.8	1.002	7.6	1.018
3.9	1.006	7.7	1.016
4.0	1.010	7.8	1.014
4.1	1.014	7.9	1.012
4.2	1.018	8.0	1.010
4.3	1.022	8.1	1.008
4.4	1.026	8.2	1.006
4.5	1.030	8.3	1.004
4.6	1.034	8.4	1.002
4.7	1.038	8.5	1.000
4.8	1.042	8.6	0.998
4.9	1.046	8.7	0.996
5.0	1.050	8.8	0.994
5.1	1.050	8.9	0.992
5.2	1.050	9.0	0.990
5.3	1.050	9.1	0.960
5.4	1.050	9.2	0.930
5.5	1.050	9.3	0.900
5.6	1.050	9.4	0.870
5.7	1.050	9.5	0.840
5.8	1.050	9.6	0.810
5.9	1.050	9.7	0.780
6.0	1.050	9.8	0.750
6.1	1.048	9.9	0.720
6.2	1.046	> 9.9	Remove and Replace
6.3	1.044		

- 1. Payment for Incomplete Placement Lots.** Pay adjustments for incomplete placement lots described under Section 3268.4.I.3.a(2), “Incomplete Placement Lots,” will be calculated using the average of the placement pay factors from all sublots sampled and sublots where the random location falls in an area designated on the plans as not eligible for in-place air void determination. A placement pay adjustment factor of 1.000 will be assigned to any lot when the random sampling plan did not result in collection of any samples.
- 2. Placement Sublots Subject to Removal and Replacement.** If after referee testing, the placement pay adjustment factor for any subplot results in a “remove and replace” condition as listed in Table 17, the Engineer will choose the location of

two cores to be taken within 3 ft. of the original failing core location. The Contractor will obtain the cores in the presence of the Engineer. The Engineer will take immediate possession of the untrimmed cores and submit the untrimmed cores to the Construction Division, where they will be trimmed if necessary and tested for bulk specific gravity within 10 working days of receipt. The average bulk specific gravity of the cores will be divided by the Engineer's average maximum theoretical specific gravity for that lot to determine the new pay adjustment factor of the subplot in question. If the new pay adjustment factor is 0.700 or greater, the new pay adjustment factor will apply to that subplot. If the new pay adjustment factor is less than 0.700, no payment will be made for the subplot. Remove and replace the failing subplot, or the Engineer may allow the subplot to be left in place without payment. The Engineer may also elect to accept the subplot in accordance with Item 5, "Control of the Work," Section 5.3.A "Acceptance of Defective or Unauthorized Work." Replacement material meeting the requirements of this Item will be paid for in accordance with this Section.

- C. Total Adjusted Pay Calculation.** Total adjusted pay (TAP) will be based on the applicable pay adjustment factors for production and placement for each lot.

$$TAP = (A+B)/2$$

where:

$A = \text{Bid price} \times \text{production lot quantity} \times \text{average pay adjustment factor for the production lot}$

$B = \text{Bid price} \times \text{placement lot quantity} \times \text{average pay adjustment factor for the placement lot} + (\text{bid price} \times \text{quantity placed in miscellaneous areas} \times 1.000)$

$\text{Production lot quantity} = \text{Quantity actually placed} - \text{quantity left in place without payment}$

$\text{Placement lot quantity} = \text{Quantity actually placed} - \text{quantity left in place without payment} - \text{quantity placed in miscellaneous areas}$

SPECIAL SPECIFICATION

6055

In-Lane or Transverse Rumble Strips

1. **Description.** This Item shall govern for furnishing and installing in-lane or transverse rumble strips as shown on the plans.
2. **Materials.** Provide rumble strips from manufacturers prequalified by the Department. The Traffic Operations Division maintains a list of prequalified rumble strip manufacturers.
3. **Construction.** Install the in-lane or transverse rumble strips in locations shown in the plans. Install the rumble strips in accordance to manufacturer's recommendations.
4. **Measurement.** This Item will be measured transversely by the foot across the lanes on which the rumble strip is installed. Measurement shall include all strips of materials placed across the roadway surface.
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 "In-Lane or Transverse Rumble Strips." This price shall be full compensation for all labor, equipment, tools and incidentals necessary to complete the work.

SPECIAL SPECIFICATION

6834

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 595b, except paint the sign face assembly flat black.

- A. **Minimum Luminance Requirements.** All PCMS units shall meet the following luminance requirements measured at the character level in candela as is published in Report 4940-2, "Photometric Requirements for Portable Changeable Message Signs," conducted by the Texas Transportation Institute. Luminance will be tested in accordance with Tex-880.
 - Minimum Daytime Character Luminance of 4000cd/m² with a contrast ratio of 5.
 - Minimum Nighttime Character Luminance of 30/cd/m².
- B. **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.
- C. **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 78 in. high x 126 in. wide sign housing. Provide a minimum 18 in. character height. Provide a 5 x 7 character pixel matrix. Provide a message visibility distance of 750 ft. 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.
- D. 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.
- E. Power Source.** Provide a diesel generator, solar powered power source, or both. Provide a backup power source as necessary.
- F. 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 shall 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 shall 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

6986

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 in lieu 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 prior to 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 Material Producer List (MPL) entitled "Pavement Markings (Permanent, Prefabricated)" maintained by the Department.
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.):
 - A. **Preparation and Application.** Use equipment designed for the pavement preparation and application of the type of PPM material selected.
 - B. **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.
 - C. **Retroreflectometer.** Unless otherwise shown on the plans, provide a portable or mobile retroreflectometer meeting the following requirements.
 1. **Portable Retroreflectometer.** Provide a portable retroreflectometer that meets the requirements of ASTM E 1710.
 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 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 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 insure accuracy.

4. Construction.

- A. 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, 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.

- B. 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 D 913) 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.

- C. 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.

- A. 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

- B. 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

- C. 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.
- D. Performance Evaluation Procedures.** Provide traffic control and conduct evaluations of color, retroreflectivity, and durability as required or directed.
- 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.
 - 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.

3. **Durability.** Measure durability in accordance with ASTM D 913 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.D, "Performance Evaluation Procedures." Conduct retroreflectivity evaluations according to Section 5.D.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 MPL entitled "Pavement Markings (Multipolymer)," 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.

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: _____
(Warrantor Officer)

**SURETY (Print Firm Name and Seal)

By: _____
(Title)

* By: _____
(Warrantor Officer)

**SURETY (Print Firm Name and Seal)

By: _____
(Title)

**SURETY (Print Firm Name and Seal)

By: _____
(Title)

* Attach a Power of Attorney showing that the officer of the warrantor 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.