
To: All Bidders

From: Bowman Consulting Group, LTD
807 Las Cimas Pkwy, Suite 350
Austin, TX 78746

Date: March 6, 2026

RE: **Dhanani Way and DPEG Zarzamora** – Bid
Addendum 3

To All Bidders,

This Addendum forms a part of the Contract and corrects or modifies original Bid Documents, issued on February 23, 2025. Acknowledge receipt of this addendum in space provided on bid form. Failure to do so may subject bidder to disqualification.

Addendum 3.

Contract Revisions:

- Replace the Table of Contents in its entirety
- Add COSA specifications 202 (Prime Coat), 203 (Tack Coat), 205 (Hot Mix Asphaltic Concrete Pavement), 413 (Flowable fill), & 522 (Sidewalk Pipe Railing)
- ADD TXDOT Specifications 465 (Junction Boxes, Manholes, and Inlets)
- Replace Contract Agreement 00520 in its entirety:
 - **Private Improvements:**
 - **101.1-P:** Quantity updated from 5.54 AC to 8.48 AC
 - **111-S-P:** Added new pay item to import soil or private improvements
 - **507.2:** Revised the quantity and description
 - **507.5:** Revised the description
 - **401.1-30:** Quantity updated from 182 LF to 214 LF
 - **465 4001:** Added new pay item for Stormwater manholes
 - **550.1-S:** Quantity updated from 182 LF to 214 LF
 - **307.2-C:** Quantity updated from 517 SY to 539 SY
 - **Public Improvements:**
 - **101.1:** Quantity updated from 36.79 AC to 27.64 AC
 - **103.3:** Quantity updated from 393 SF to 3537 SF
 - **103.4:** Quantity updated from 113SF SF to 1,013 SF

- **104 6001:** Revised pay item name from 105 2085. Quantity updated from 6,833 SY to 6,933 SY
- **105 6011:** Revised pay item name from 105 2085-R. Revised Description Quantity updated from 783 SY to 1,285 SY.
- **202.1:** Added new pay item Prime coat for street repair after SAWS utility installation.
- **203.1:** Added new pay item Tack coat for street repair after SAWS utility installation.
- **205.4:** Added new pay item Hot Mix Asphaltic Pavement Type D for street repair after SAWS utility installation.
- **413.2:** Added new pay item Flowable Fill Subgrade for street repair after SAWS utility installation.
- **111-S:** Added new pay item to import soil for public improvements
- **260 2079:** Revised pay item name from 108.1. Quantity updated from 11,634 SY to 13,940 SY
- **209.1:** Quantity updated from 11,634 SY to 11,971 SY
- **502.1:** Quantity updated from 2,656 SY to 4,429 SY
- **522.1:** Added new pay item sidewalk pipe railing.
- **515.1:** Quantity updated from 3,532 CY to 25,669 CY
- **520.1:** Quantity updated from 190,710 SY to 154,013 SY
- **540.1:** Quantity updated from 240 LF to 150 LF
- **540.6:** Quantity updated from 515 SY to 334 SY
- **540.9:** Quantity updated from 5,540 LF to 6,483 LF
- **540.10:** Quantity updated from 120 LF to 138 LF
- **TXDOT Improvements:**
- **100:** Quantity updated from 0.43 AC to 1.59 AC
- **Removed Items:** 341.1, 341.2, and 260
- **360 2023:** Added new pay item for 6" Concrete Pavement for the Deceleration Lanes and Driveways
- **247:** Added new pay item for 6" Subbase for the Deceleration Lanes and Driveways
- **529:** Quantity updated from 890 LF to 1623 LF
- **531:** Quantity updated from 1,083 SY to 3,894 SY
- **SAWS Water Improvements:**
- **856.1:** Quantity updated from 32 LF to 107 LF
- **SAWS Wastewater Improvements:**
- **856.2:** Quantity updated from 98 LF to 134 LF

Bid Tab Revisions:

- Replace the Bid Tab in its entirety to:
- Update pay items to match the Form 00520 Contract Agreement
- Add fee for Construction Staking to be done by Bowman

Drawing Revisions:

Dhanani Way Public Street and Drainage Plan & Profile:

- Replace sheet C0.1, C2.4, C4.13, to update geotechnical report information
- Replace sheets C0.2-C0.3 for updated plat
- Replace sheet C1.0 to revise areas of pavement removal
- Replace sheet C2.1-C2.3 to revise box culvert size to 6'x3', update label referencing detail sheet, and add proposed utility crossings in the profiles.
- Replace C2.5 for updated Strech Avenue section view and updated notes.
- Replace C2.6-C2.7 for updated paving legend, Notes, and new table for Concrete recommended minimum thicknesses from the geotechnical report. Updated labels on Driveway 3 Paving Plan.
- Replace C4.3 to update section views, pilot channel flow lines, add stormwater manholes at outfall, show label for sidewalk pipe railing
- Replace C4.4 to update section views, add mortared rock wall detail for ponds, show label for sidewalk pipe railing, gate and fence detail reference.
- Replace C4.6-C4.7 for updated callouts on section view to retaining wall detail on sheet C5.6B.
- Replace C4.9 for revised plan views. Remove conflicting spot grades.
- Replace C4.10-C4.11 to add the proposed 24" storm water pipes in the plan and profile. Update Geotechnical Report date information.
- Replace C4.15-C4.16 to add the utility crossings on the profile
- Replace C5.3 to add Chain Link Wire Fence Standards Details
- Replace C5.6A to add Precast Round Manhole Detail for the stormwater manholes at the outfall of Pond A.
- Replace C6.0 to add Limits of Construction line, add a second stabilized construction entrance, a concrete washout, and 2 staging areas. The proposed rock berms have been shifted with the new pond outfall layout.
- Replace C6.1 for added Inlet Protection Detail.

DPEG Zarzamora Public Water Plan

- Replace Sheet C2.3 to add 75 LF of 24" steel encasement and add a detail for an encased water main crossing under the storm drain.

DPEG Zarzamora Public Sewer Plan:

- Replace sheets CS0.1-CS0.2 for updated plat
- Replace Sheet CS2.0 to add 36 LF of 24" steel encasement.

Thank you,

Areli Castillo

Areli Castillo
Engineer
Bowman

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City of San Antonio Standard Technical Specifications

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Series 400

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Texas Department Of Transportation (TXDOT) Standard Specifications For Construction

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

Prepared By



Endorsed By



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AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between _____ (“Owner”) and _____ (“Contractor”).

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: **DPEG Zarzamora and Dhanani Way; Work shall include water, wastewater, streets, and drainage, and TXDOT turn lanes.**

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **A commercial and multi-family residential development**

ARTICLE 3—ENGINEER

3.01 The Owner has retained **Bowman Consulting Group Ltd.** (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by **Bowman Consulting Group Ltd.**

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.03 *Contract Times: Days*

A. The Work will be substantially complete within **180** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **180** days after the date when the Contract Times commence to run.

4.05 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration

proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner \$ 250.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
 2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$ 250.00 for each day that expires after such time until the Work is completed and ready for final payment.
 3. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.
- B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

ARTICLE 5—CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

- A. For all Work other than Unit Price Work, a lump sum of \$_____.

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

- B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

Unit Price Work					
Bid Item	Quantity	Unit	Item Description	Unit Price	Extended Price
Private Improvements- DPEG ZARZAMORA					
101.1-P	8.48	AC	PREPARING RIGHT-OF-WAY (CLEARING) (Complete in Place)	\$	\$
105.1-P	30,322	CY	DETENTION PONDS A & B EXCAVATION (Complete in Place)	\$	\$
105.1	3,036	CY	INTERCEPTOR CHANNEL EXCAVATION (Complete in Place)	\$	\$
107.1-P	37,245	CY	EMBANKMENT (Final)	\$	\$
111-S-P	3,887	CY	IMPORT SOIL	\$	\$
507.2	7,851	LF	6FT CHAIN LINK WIRE FENCE (Complete in Place)	\$	\$
507.5	1	EA	10FT VEHICULAR GATE (Complete in Place)	\$	\$
401.1-30	214	LF	REINFORCED CONCRETE PIPE - PER LINEAR FOOT (CLASS III) (30 INCHES DIA.) (Complete in Place)	\$	\$
465 4001	2	EA	MANHOLE (COMPL) (PRM) (48in) (Complete in Place)	\$	\$
550.1-S	214	LF	TRENCH SAFETY (Complete in Place)	\$	\$
307.2	4,509	SY	INTERCEPTOR CONCRETE CHANNEL (Complete in Place)	\$	\$
423 6005	15,203	SF	RETAINING WALL (SPREAD FOOTING) (Complete in Place)	\$	\$
307.2-C	539	SY	POND CONCRETE PILOT CHANNEL (Complete in Place)	\$	\$
307.5	2	EA	POND WEIR STRUCTURE (Complete in Place)	\$	\$
307.2-F	35	SY	STRUCTURAL CONCRETE FLUME (Complete in Place)	\$	\$
307.2-S	182	SY	CONCRETE TO PREVENT EROSION (Complete in Place)	\$	\$



Public Improvements- Dhanani Way					
GENERAL CONDITIONS					
100.1	1	LS	SITE MOBILIZATION (Complete in Place)	\$	\$
100.2	1	LS	PAYMENT AND PERFORMANCE BOND	\$	\$
540	1	LS	SWPPP DOCUMENT PREP, POSTING, NOTICES, AND INSPECTIONS	\$	\$
DEMOLITION					
101.1	27.64	AC	PREPARING RIGHT-OF-WAY (CLEARING) (Complete in Place)	\$	\$
103.3	3,537	SF	REMOVE SIDEWALKS (To Be Replaced With New Sidewalk Along Strech Ave) (Complete In Place)	\$	\$
103.4	1,013	SF	REMOVE MISCELLANEOUS CONCRETE (Complete In Place)	\$	\$
104 6001	6,933	SY	REMOVE PAVEMENT (Complete In Place)	\$	\$
105 6011	1285	SY	REMOVE ASPHALT PAVEMENT (To Be Replaced For Saws Utility) (Complete In Place)	\$	\$
202.1	386	GAL	REPLACE PRIME COAT (Complete in Place)	\$	\$
203.1	129	GAL	REPLACE TACK COAT (Complete in Place)		
205.4	1285	SY	REPLACE HOT MIX ASPHALTIC PAVEMENT TYPE D (Complete in Place)		
413.2	428	CY	FLOWABLE FILL SUBGRADE (Up to 1' Thick) (Complete in Place)	\$	\$
EARTHWORK					
104.1	45,796	CY	STREET EXCAVATION (Complete in Place)	\$	\$
107.1-S	124,129	CY	EMBANKMENT (Final)	\$	\$
110-7003	57,680	CY	SITE EXCAVATION (Complete in Place)	\$	\$
111-S	17,302	CY	IMPORT SOIL (Complete in Place)	\$	\$
DHANANI WAY STREET IMPROVEMENTS					
500.1	6,162	LF	STANDARD CURB (Complete in Place)	\$	\$
260 2079	13,940	SY	LIME TREATED SUBGRADE - (6 INCHES COMPACTED DEPTH) (Complete in Place)	\$	\$

209.1	11,971	SY	CONCRETE PAVEMENT- AT 8 INCHES OF DEPTH (Complete in Place)	\$	\$
502.1	4,429	SY	6FT CONCRETE SIDEWALKS – CONVENTIONALLY FORMED (Complete in Place)	\$	\$
522.1	3700	LF	SIDEWALK PIPE RAILING	\$	\$
531 6005	2	EA	CURB RAMP AND LANDING (TYPE II) (Complete in Place)	\$	\$
530.1	1	LS	BARRICADES, SIGNS AND TRAFFIC HANDLING (Complete in Place)	\$	\$

TXDOT ROAD AND DRAINAGE IMPROVEMENTS					
100	1.59	AC	PREPARING RIGHT-OF-WAY (CLEARING) (Complete in Place)	\$	\$
360 2023	2,204	SY	6" CONCRETE PAVEMENT (Complete in Place)	\$	\$
247	2,747	SY	6" SUBBASE (Complete in Place)	\$	\$
104	848	LF	REMOVE CONCRETE CURB (Complete in Place)	\$	\$
529	1,623	LF	7" CONCRETE CURB AND GUTTER (Complete in Place)	\$	\$
531	3,894	SY	10' SIDEWALK (Complete in Place)	\$	\$
465 6233	3	EA	Inlet (COMP) (TY Sidewalk Bridge) (Complete in Place)	\$	\$
636	1	LS	STRIPING AND SIGNAGE (Complete in Place)	\$	\$
536 7001	158	LF	6" RAISED CONCRETE MEDIAN (Complete in Place)	\$	\$
110	5,815	CY	TXDOT INTERCEPTOR CHANNEL EXCAVATION (Complete in Place)	\$	\$
132	2,464	CY	TXDOT INTERCEPTOR CHANNEL EMBANKMENT (Final)	\$	\$
462 6014	169	LF	7X3 SINGLE BOX CULVERT (Complete in Place)	\$	\$
462 6164	76	LF	7X2 SINGLE BOX CULVERT (Complete in Place)	\$	\$
467	4	EA	SAFETY END TREATMENT FOR SBC (Complete in Place)	\$	\$
EROSION CONTROL IMPROVEMENTS					
515.1	25,669	CY	6" TOPSOIL (Complete in Place)	\$	\$



520.1	154,013	SY	HYDROMULCHING (Complete in Place)	\$	\$
540.1	150	LF	ROCK BERM (Complete in Place)	\$	\$
540.6	334	SY	STABILIZED CONSTRUCTION EXIT (Complete in Place)	\$	\$
540.9	6483	LF	SILT FENCE WITH J HOOKS (Complete in Place)	\$	\$
540.10	138	LF	INLET PROTECTION (Complete in Place)	\$	\$

DRAINAGE IMPROVEMENTS

401.1-24	1,354	LF	REINFORCED CONCRETE PIPE - PER LINEAR FOOT (CLASS III) (24 INCHES DIA.) (Complete in Place)	\$	\$
401.4	1	EA	24" Safety End Treatment 6:1 (Complete in Place)	\$	\$
403.1	6	EA	JUNCTION BOX (COMPLETE) 4'X4'X4' (Complete in Place)	\$	\$
403.4	11	EA	JUNCTION BOX (COMPLETE) 7'X7'X7' (Complete in Place)	\$	\$
403.6-10	2	EA	JUNCTION BOX (COMPLETE) 10'X10'X10' (Complete in Place)	\$	\$
403.10	6	EA	INLET (COMPLETE) 20' (Complete in Place)	\$	\$
462 6010	2950	LF	6X3 SINGLE BOX CULVERT (Complete in Place)	\$	\$
462-MC-6-616	450	LF	6x3 MULTIPLE BOX CULVERT (Complete in Place)	\$	\$
466 2065	1	EA	24" Headwall with Dissipators (Complete in Place)	\$	\$
466 2330	1	EA	7' Headwall with Dissipators (Complete in Place)	\$	\$
466 6179	4	EA	CONCRETE WINGWALL WITH PARALLEL WINGS (Complete in Place)	\$	\$
550.1	4,304	LF	Trench Safety (Complete in Place)	\$	\$
7087-6048	1	EA	TIE INTO EXISTING STORM DRAIN (Complete in Place)	\$	\$

SAWS WATER IMPROVEMENTS

550-W	3,758	LF	TRENCH SAFETY (Complete in Place)	\$	\$
812.0	3,758	LF	12" PVC C900 CL 235 DR 18 WATER LINE (Complete in Place)	\$	\$



828.0	8	EA	12" GATE VALVE, COMPLETE WITH VALVE BOX & COVER (Complete in Place)	\$	\$
830.0	1	EA	24" BUTTERFLY VALVE W/ VALVE BOX & COVER (Complete in Place)	\$	\$
834.0	5	EA	FIRE HYDRANT ASSEMBLY, COMPLETE (Complete in Place)	\$	\$
839.0	376	LF	12" JOINT RESTRAINTS (Complete in Place)	\$	\$
840.0	2	EA	TIE TO EXISTING WATERLINE (Complete in Place)	\$	\$
844.0	2	EA	2" - TEMPORARY BLOW OFF (Complete in Place)	\$	\$
847.0	1	EA	HYDROSTATIC TESTING	\$	\$
856.1-T	113	LF	24" STEEL ENCASEMENT VIA TRENCHLESS INSTALL (Complete in Place)	\$	\$
856.1	107	LF	24" STEEL ENCASEMENT (Complete in Place)	\$	\$
7181-6056	235	LF	CONCRETE CAP (Complete in Place)	\$	\$
SAWS WASTEWATER IMPROVEMENTS					
550-WW	3,734	LF	TRENCH SAFETY (Complete in Place)	\$	\$
848.1	713	LF	8" SDR 26 PVC PIPE (0'-8' DEPTH) (Complete in Place)	\$	\$
848.2	1,457	LF	8" SDR 26 PVC PIPE (8'-12' DEPTH) (Complete in Place)	\$	\$
848.3	1,564	LF	8" SDR 26 PVC PIPE (12'-16' DEPTH) (Complete in Place)	\$	\$
851.0	1	EA	Tie to Existing Wastewater Line (Complete in Place)	\$	\$
852.0	14	EA	4' STANDARD MANHOLE (Complete in Place)	\$	\$
852.1	51	VF	MANHOLE EXTRA DEPTH (4' DIA.) (Complete in Place)	\$	\$
856.2	134	LF	24" ~ STEEL ENCASEMENT (Complete in Place)	\$	\$
856.2-T	115	LF	24" ~ STEEL ENCASEMENT VIA TRENCHLESS INSTALL (Complete in Place)	\$	\$
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)					\$

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions,



estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

- C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) \$_____.

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the **25th** day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

- a. 90% percent of the value of the Work completed (with the balance being retainage).

- 1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

- b. 90% percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

- A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

- A. All amounts not paid when due will bear interest at the rate of 0% percent per annum.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

- A. The Contract Documents consist of all of the following:
1. This Agreement.
 2. Bonds:
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
 3. General Conditions.
 4. Specifications as listed in the table of contents of the project manual (copy of list attached).
 5. Drawings (not attached but incorporated by reference) consisting of 3 plan sets with each plan set bearing the following general titles:

Dhanani Way Public Street and Drainage Plan & Profile
DPEG Zarzamora Public Sewer Plan
DPEG Zarzamora Public Water Plan
 6. Addenda (numbers _____ to _____, inclusive).
 7. Exhibits to this Agreement (enumerated as follows):
 8. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
 - e. Warranty Bond, if any.
- B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
5. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
6. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
7. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
8. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
9. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:
 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or “track changes” (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

Owner:

Contractor:

(typed or printed name of organization)

(typed or printed name of organization)

By: _____
(individual's signature)

By: _____
(individual's signature)

Date: _____
(date signed)

Date: _____
(date signed)

Name: _____
(typed or printed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

(If [Type of Entity] is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____
(individual's signature)

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

Address for giving notices:

Address for giving notices:

Designated Representative:

Designated Representative:

Name: _____
(typed or printed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

Address:

Phone: _____

Phone: _____

Email: _____

Email: _____

(If [Type of Entity] is a corporation, attach evidence of authority to sign. If [Type of Entity] is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

License No.: _____
(where applicable)

State: _____

ITEM

202 PRIME COAT

202.1. DESCRIPTION: *This item shall govern for the application of asphaltic material on the completed base course and/or other areas in accordance with this specification and as directed by the Engineer. Apply blotter material as required.*

202.2. MATERIALS: Provide materials in accordance with the following requirements:

A. Bituminous. Unless the type and grade are shown on the plans, utilize an MC-30 or AE-P asphalt cement in accordance with Item 300, "Asphalts, Oils, and Emulsions" of the Standard Specifications of the Texas Department of Transportation for prime coat. Where Emulsified Asphalts are used, the amount of emulsified asphalt as a percentage by volume of the total mixture shall be within the limits shown on the plans, or shall be of a percentage as directed by the Engineer.

B. Blotter. Unless otherwise shown on the plans or approved, use either base course sweepings obtained from cleaning the base or sand as blotter materials.

202.3. EQUIPMENT: Provide applicable equipment in accordance with this specification or as specified on the plans.

A. Distributor. Furnish a distributor that will apply the asphalt material uniformly at the specified rate or as directed.

1. Transverse Variance Rate. When a transverse variance rate is shown on the plans, confirm that the nozzles outside the wheel paths will output a predetermined percentage more of asphalt material by volume than the nozzles over the wheel paths.

2. Calibration.

a. Transverse Distribution. Furnish a distributor test report, no more than 1 year old, documenting that the variation in output for individual nozzles of the same size does not exceed 10% when tested at the greatest shot width in accordance with Tex-922-K, "Calibrating Asphalt Distribution Equipment," Part III.

Include the following documentation on the test report:

- the serial number of the distributor,
- a method that identifies the actual nozzle set used in the test, and
- the fan width of the nozzle set at a 12 inch bar height.

When a transverse variance rate is required, perform the test using the type and grade of asphalt material to be used on the project. The Engineer may verify the transverse rate and distribution at any time. If verification does not meet the requirements, correct deficiencies and furnish a new test report.

B. Tank Volume. Furnish a volumetric calibration and strap stick for the distributor tank in accordance with Tex-922-K, "Calibrating Asphalt Distribution Equipment," Part I.

Calibrate the distributor within the previous 3 years of the date first used on the project. The Engineer may verify calibration accuracy in accordance with Tex-922-K, "Calibrating Asphalt Distribution Equipment," Part II.

- C. **Computerized Distributor.** When paying for asphalt material by weight, the Engineer may allow use of the computerized distributor display to verify application rates. Verify application rate accuracy at a frequency acceptable to the Engineer.
- D. **Broom.** Furnish rotary, self-propelled brooms.
- E. **Rollers.** Rollers provided shall meet the requirements for their type as shown in Item 210, "Rollers."
- F. **Asphalt Storage and Handling Equipment.** When the plans or the Engineer allows storage tanks, furnish a thermometer in each tank to indicate the asphalt temperature continuously.

Keep equipment clean and free of leaks. Keep asphalt material free of contamination.

- G. **Digital Measuring Instrument.** Furnish a vehicle with a calibrated digital-measuring instrument accurate to ± 6 ft. per mile.

202.4. CONSTRUCTION:

- A. **General.** Apply the mixture when the air temperature is 60°F and above, or above 50°F and rising. Measure the air temperature in the shade away from artificial heat. The Engineer will determine when weather conditions are suitable for application.

Do not permit traffic, hauling, or placement of subsequent courses over freshly constructed prime coats. Maintain the primed surface until placement of subsequent courses or acceptance of the work.

- B. **Surface Preparation.** Prepare the surface by sweeping or other approved methods. When directed, before applying bituminous material, lightly sprinkle the surface with water to control dust and ensure absorption.

- C. **Application.**

- 1. **Bituminous.** The Engineer will select the application temperature within the limits recommended in Item 300, "Asphalts, Oils, and Emulsions." Apply material within 15°F of the selected temperature.

Unless otherwise shown on the plans, prime coat shall be applied at a rate not to exceed 0.20 gallon per square yard of surface. The prime coat shall be applied evenly and smoothly, under a pressure necessary for proper distribution.

When emulsified asphalts are used as prime coat, agitate the water and emulsified asphalt to produce a uniform blend. Evenly distribute, at the rate specified, to locations shown on the plans or as directed. Regulate the percentage of emulsified asphalt in the mixture and distribute successive applications to achieve the specified rate, if necessary.

During the application of prime coat, care shall be taken to prevent splattering of adjacent pavement, curb and gutters or structures. When directed, roll the freshly applied prime coat with a pneumatic-tire roller to ensure penetration.

2. **Blotter.** Spread blotter material before allowing traffic to use a primed surface. When “Prime Coat and Blotter” is shown on the plans as a bid item, apply blotter material to primed surface at the rate shown in the plans or as directed. When “Prime Coat” is shown on the plans as a bid item, apply blotter to spot locations or as directed to accommodate traffic movement through the work area. Remove blotter material before placing the surface. Dispose of blotter material according to applicable state and federal requirements.
- 202.5. MEASUREMENT:** The asphaltic material for prime coat will be measured at the point of delivery on the project in gallons at the applied temperature. The quantity to be paid for shall be the number of gallons of asphaltic material used, as directed, in the accepted prime coat to the pay limits as shown on the plans. When emulsions are used, only that percentage of emulsified asphalt as a percentage by volume of the total mixture shall be paid for by the gallon of asphaltic material used in the accepted prime coat. Water used will not be measured for payment.
- 202.6. PAYMENT:** The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Prime Coat” or “Prime Coat and Blotter” of the type and grade of bituminous material specified. This price is full compensation for cleaning and sprinkling the area to be primed; materials, including blotter material; and rolling, equipment, labor, tools, and incidentals.
- 202.7. BID ITEM:**
- Item 202.1 - Prime Coat - per gallon
- Item 202.2 - Prime Coat and Blotter - per gallon

ITEM**203 TACK COAT**

203.1. DESCRIPTION: *Apply asphaltic material on the completed base course after the prime coat has sufficiently cured, existing pavement, bituminous surface, or in the case of a bridge, on the prepared floor slab in accordance with these specifications and/or as directed by the Engineer.*

203.2. MATERIALS: The asphaltic material used for Tack Coat shall meet the requirements for “Asphalt Cement”, “Cut-Back Asphalt” or “Emulsified Asphalt” in Item No. 300, “Asphalts, Oils and Emulsions” of the Texas Department of Transportation Standard Specifications. The asphaltic material used for Tack Coat shall be the type or grade shown in the referring specification, or on the plans, or as directed/approved by the Engineer.

203.3. EQUIPMENT: Provide equipment that conforms to the requirements of Item 202, “Prime Coat,” Part 3, “Equipment.”

203.4. CONSTRUCTION: Before the tack coat is applied, the surface shall be cleaned thoroughly with a vacuum sweeper to the satisfaction of the Engineer. The asphaltic material shall be applied on the clean surface by an approved type of self-propelled pressure distributor evenly and smoothly under a pressure necessary for proper distribution.

The tack coat shall be applied at the rate specified by the referring specification or on the plans. Unless otherwise stated or allowed by the Engineer the application rate shall not exceed 0.10 gallon per square yard of surface.

Where the pavement mixture will adhere to the surface on which it is to be placed without the use of a tack coat, the tack coat may be eliminated by the Engineer. All contact surfaces of curbs and structures and all joints shall be painted with a thin uniform coat of the asphaltic material used for tack coat. During the application of tack coat, care shall be taken to prevent splattering of adjacent pavement, curb and gutters or structures.

203.5. MEASUREMENT: The asphaltic material for tack coat will be measured at point of delivery on the project in gallons at the applied temperature. The quantity to be paid for shall be the number of gallons of asphaltic material used, as directed, in the accepted tack coat. Water used with Emulsions will not be measured for payment.

203.6. PAYMENT: The work performed and materials furnished as prescribed by this item will be paid for at the contract unit price bid per gallon for “Tack Coat” which price shall be full compensation for cleaning the surface, for furnishing, heating, hauling and distributing the tack coat as specified; for all freight involved; and for all manipulations, labor, tools, equipment, and incidentals necessary to complete the work.

203.7. BID ITEM:

Item 203.1 - Tack Coat - per gallon

ITEM

205 HOT MIX ASPHALTIC CONCRETE PAVEMENT

205.1. DESCRIPTION: *Construct a leveling-up course, a surface course or any combination of these courses as shown on the plans, each to be composed of a compacted mixture of mineral aggregate and asphaltic material. The pavement shall be constructed on the newly constructed subgrade or base course, existing pavement, bituminous surface or in the case of bridges, on the prepared floor slab, as herein specified and in accordance with the details shown on the plans.*

205.2. MATERIALS: Materials used in Hot Mix Asphaltic Concrete Pavement shall meet the requirements as set forth herein. If shown on the plans, materials may also meet the requirements as described in Item 340, "Dense-Graded Hot-Mix Asphalt (Method)" or Item 341, "Dense-Graded Hot-Mix Asphalt (QC/QA)" of the Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges.

Unless otherwise shown on the plans, provide aggregates that meet the aggregate quality requirements of TxDOT's Bituminous Rated Source Quality Catalog (BRSQC). Unapproved sources may be used if accepted by the Engineer and approved prior to use.

Furnish aggregates from sources that conform to the requirements shown in Table 1 herein, and as specified in this Section, unless otherwise shown on the plans. Provide aggregate stockpiles that meet the definition in this Section for either a coarse aggregate or fine aggregate. When reclaimed asphalt pavement (RAP) is used, provide RAP stockpiles in accordance with this Section. Aggregate from RAP is not required to meet Table 1 requirements unless otherwise shown on the plans.

Document all test results on a mixture design report and submit to the Engineer for approval. The Engineer may perform tests on independent or split samples to verify Contractor mix design 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 TxDOT standard laboratory test procedure Tex-200-F, Part II. Do not add material to an approved stockpile from other sources, unless otherwise approved by the Engineer.

Unless otherwise shown on the plans, reclaimed asphalt pavement (RAP) may be used in asphalt pavement maintenance or rehabilitation applications and shall be limited to a maximum of 20% RAP for surface or wearing courses and 30% RAP for courses below the surface or wearing course. Higher percentages of RAP may be used if requested in writing and approved by the Engineer prior to use.

A. Coarse Aggregate. Coarse aggregate stockpiles must have no more than 20% passing the #8 sieve. Provide aggregates with a surface aggregate classification (SAC) as shown below:

<u>Street Classification</u>	<u>Minimum Surface Aggregate Classification</u>
Primary and Secondary Arterials	A
Collector and Local Type B Streets	B
Local Type A Street With Bus Traffic	B
Local Type A Street Without Bus Traffic	C

SAC requirements apply only to aggregates used on the surface of travel lanes, unless otherwise shown on the plans. Blending aggregates to meet SAC criteria is allowable. 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. When blending, do not use Class C or D aggregates. For blending purposes, coarse aggregate from RAP will be considered as Class B aggregate.

- B. Reclaimed Asphalt Pavement (RAP).** RAP is defined as a salvaged, pulverized, broken or crushed asphalt pavement. The RAP to be used in the mix shall be crushed or broken to the extent that 100% will pass the two inch sieve.

The stockpiled RAP shall not be contaminated by dirt or other objectionable materials. Unless otherwise shown on the plans, stockpiled, crushed RAP shall have a decantation of 5% or less and a plasticity index of eight (8) or less, when tested in accordance with TxDOT standard laboratory test procedures Tex-406-A, Part I, and Tex-106-E, respectively. This requirement applies to stockpiles from which the asphalt has not been removed by extraction. When RAP is used, determine asphalt content and gradation for mixture design purposes.

- C. Fine Aggregate.** Fine aggregates may consist of manufactured sands, screenings and field sands. Supply fine aggregates that are free from organic impurities. Field sands and other uncrushed aggregates shall be limited to 15% of the total aggregate.

If 10% or more of the fine aggregate 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 (TxDOT standard laboratory test procedure Tex-460-A) and flat and elongated particles (TxDOT standard laboratory test procedure Tex-280-F).

- D. Asphalt Binder.** Unless shown on the plans, provide the type and grade of performance-graded asphalt binder in accordance with TxDOT Item 300.2.J. “Performance-Graded Binders” and as specified below:

Street Classification	Minimum PG Asphalt Cement Grade		
	Surface Courses	Binder & Level Up Courses	Base Courses
Primary and Secondary Arterials	PG 76-22	PG 70-22	PG 64-22
Collector and Local Type B Streets	PG 70-22		
Local Type A Street With Bus Traffic		PG 64-22	
Local Type A Street Without Bus Traffic	PG 64-22		

- E. Mineral Filler.** Mineral filler consists of finely divided mineral matter such as agricultural lime, crusher fines, hydrated lime, cement, or fly ash. Mineral filler is allowed unless otherwise shown on the plans. Do not use more than 2% hydrated lime or cement, unless otherwise shown on the plans. 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 of Table 3 herein.

F. Baghouse Fines. Fines collected by the baghouse or other dust collecting equipment may be reintroduced into the mixing drum.

G. Tack Coat. Unless otherwise shown on the plans or approved, furnish CSS-1H, SS-1H, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder and in accordance with Item 203, “Tack Coat.” Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use.

H. Additives. When shown on the plans, use the type and rate of additive specified. Other additives that facilitate mixing or improve the quality of the mixture may be allowed when approved. If lime or a liquid antistripping agent is used, add in accordance with TxDOT 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 back into the drum.

**Table 1
Aggregate Quality Requirements**

Property	TxDOT Standard Laboratory Test Procedure	Surface Courses	Binder, Level Up, & Base Courses
Coarse Aggregate			
Deleterious Material, %, max	Tex-217-F, Part I	1.0	1.5
Decantation, %, max	Tex-217-F, Part II	1.5	1.5
Micro-Deval Abrasion, %, max	Tex-461-A	Screening Only	Screening Only
Los Angeles Abrasion, %, max	Tex-410-A	35	40
Magnesium Sulfate Soundness, 5 cycles, %, max	Tex-411-A	25	30
Coarse Aggregate Angularity, 2 crushed faces, %, min	Tex-460-A, Part I	95 ¹	85 ¹
Flat and Elongated Particles @ 5:1, %, max	Tex-280-F	10	10
Fine Aggregate			
Linear Shrinkage, %, max	Tex-107-E	3	3
Combined Aggregate²			
Sand Equivalent, %, min	Tex-203-F	45	45

Note 1: Applies to Gravel Only

Note 2: Aggregate without mineral filler, RAP, or additives combined as used in the job-mixed formula (JMF)

**Table 2
Gradation Requirements for Fine Aggregates**

Sieve Size, in	% Passing by Weight or Volume
3/8	100
#8	70 – 100
#200	0 – 30

**Table 3
Gradation Requirements for Mineral Filler**

Sieve Size, in	% Passing by Weight or Volume
#8	100
#200	55 – 100

205.3. EQUIPMENT: All equipment for the handling of all materials, mixing, placing and compacting of the mixture shall be maintained in good repair and operating condition and subject to the approval of the Engineer. Any equipment found to be defective and potentially having a negative effect on the quality of the paving mixture or ride quality will not be allowed.

A. Spreading and Finishing Machine. The spreading and finishing machine shall be approved by the Engineer and shall meet the requirements indicated below.

- 1. Screed Unit.** The spreading and finishing machine shall be equipped with a heated compacting screed. It shall produce a finished surface meeting the requirements of the typical cross sections and the surface test.

Extensions added to the screed shall be provided with the same compacting action and heating capability as the main screed unit, except for use on variable depth tapered areas and/or as approved by the Engineer.

The spreading and finishing machine shall be equipped with an approved automatic dual longitudinal screed control system and automatic transverse screed control system. The longitudinal controls shall be capable of operating from any longitudinal grade reference including a stringline, ski, mobile stringline, or matching shoe.

The Contractor shall furnish all equipment required for grade reference. It shall be maintained in good operating condition by personnel trained in the use of this type of equipment.

The grade reference used by the Contractor may be of any type approved by the Engineer. The contractor shall set the grade reference to have sufficient support so that the maximum deflection shall not exceed 1/16 inch between supports.

- 2. Tractor Unit.** The tractor unit shall be equipped with a hydraulic hitch sufficient in design and capacity to maintain contact between the rear wheels of the hauling equipment and the pusher rollers of the finishing machine while the mixture is being unloaded.

No portion of the weight of hauling equipment, other than the connection, shall be supported by the asphalt paver. No vibrations or other motions of the loading equipment, which could have a detrimental effect on the riding quality of the completed pavement, shall be transmitted to the paver.

The use of any vehicle which requires dumping directly into the finishing machine and which the finishing machine cannot push or propel to obtain the desired lines and grades without resorting to hand finishing will not be allowed.

B. Material Transfer Equipment. Equipment to transfer mixture from the hauling units or the roadbed to the spreading and finishing machine will be allowed unless otherwise shown on the plans. A specific type of material transfer equipment shall be required when shown on the plans.

C. Motor Grader. The motor grader, when used, shall meet the requirements as shown in Item 220, "Blading."

D. Rollers. Rollers provided shall meet the requirements for their type as shown in Item 210, "Rolling."

205.4. CONSTRUCTION: It shall be the responsibility of the Contractor to design, produce, transport, place and compact the specified paving mixture in accordance with the requirements herein. The Engineer will perform verification testing as needed. Provide quality control (QC) testing as needed to meet the requirements of this Item. Provide a certified Level I-A specialist at the plant during production hours. Provide a certified Level I-B specialist to conduct placement tests.

A. Quality Control Plan (QCP). Unless otherwise shown on the plans, develop and follow a QCP. 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 and receive the Engineer's approval of the QCP before beginning production. Include the following items in the QCP.

1. Project Personnel. Provide:

- a. a list of individuals that will conduct tests as well their associated certifications (i.e. Level IA, IB, and II certifications), including when certifications will expire for each individual; and
- b. a list of individuals responsible for QC with authority to take corrective action and the contact information for each individual listed.

2. Material Delivery and Storage. Provide:

- a. the sequence of material processing, delivery, and minimum quantities to assure continuous plant operations;
- b. aggregate stockpiling procedures to avoid contamination and segregation;
- c. frequency, type, and timing of aggregate stockpile testing to assure conformance of material requirements before mixture production; and
- d. procedure for monitoring the quality and variability of asphalt binder.

3. Production. Detail:

- a. loader operation procedures to avoid contamination in cold bins;
- b. procedures for calibrating and controlling cold feeds;
- c. procedures to eliminate debris or oversized material;
- d. procedures for adding and verifying rates of each applicable mixture component (e.g., aggregate, asphalt binder, RAP, lime, liquid antistriper);
- e. procedures for reporting job control and acceptance test results; and
- f. procedures to avoid segregation and drain-down in the silo.

4. Loading and Transporting. Provide:

- a. the type and application method for release agents; and

- b. truck loading procedures to avoid segregation.

5. Placement and Compaction. Provide:

- a. the proposed agenda for mandatory pre-paving meeting including date and location;
- b. the type and application method for release agents in the paver and on rollers, shovels, lutes, and other utensils;
- c. procedures for the transfer of mixture into the paver while avoiding segregation and preventing material spillage;
- d. the process to balance production, delivery, paving, and compaction to achieve continuous placement operations;
- e. the paver operations (e.g., operation of wings, height of mixture in auger chamber) to avoid physical and thermal segregation and other surface irregularities; and
- f. procedures to construct quality longitudinal and transverse joints.

- B. Mixture Design.** Use a Level II specialist certified by a TxDOT-approved hot-mix asphalt certification program to develop the mixture design. Have the Level II specialist sign the design documents. Unless otherwise shown on the plans, use the typical weight design example given in TxDOT standard laboratory test procedure Tex-204-F, Part I or Part III, to design a mixture meeting the requirements listed in Tables 1 through 5. At the request of the Engineer, furnish representative samples of all materials used in the mixture design for verification. If the design cannot be verified by the Engineer, furnish another mixture design.

The Contractor may submit a new mixture design at anytime during the project. The Engineer will approve all mixture designs before the Contractor can begin production.

Provide the Engineer with a mixture design report that includes the following items:

- the combined aggregate gradation, source, specific gravity, and percent of each material used;
- results of all applicable tests;
- the mixing and molding temperatures;
- all applicable correlation and correction factors;
- the signature of the Level II person or persons who performed the design;
- the date the mixture design was performed; and
- a unique identification number for the mixture design.

The Hamburg Wheel Test is not required, unless otherwise shown on the plans. When required through plan note, the minimum number of passes shown in Table 6 shall be met, unless otherwise approved by the Engineer. The contractor will be responsible for submitting the results of the Hamburg Wheel test to the Engineer with the other mixture design data. Use an approved laboratory to perform the Hamburg Wheel test. The TxDOT Construction

Division maintains a list of approved laboratories that may be referenced. Hamburg Wheel Testing will not be performed or required for any Type “F” mixtures.

Table 4
Master Gradation Bands (% Passing by Weight or Volume) and Volumetric Properties

Sieve Size	A Coarse Base	B Fine Base	C Coarse Surface	D Fine Surface	F Fine Mixture
1-1/2”	98.0–100.0	–	–	–	–
1”	78.0–94.0	98.0–100.0	–	–	–
3/4”	64.0–85.0	84.0–98.0	95.0–100.0	–	–
1/2”	50.0–70.0	–	–	98.0–100.0	–
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	35.0–50.0
#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 Voids in the Mineral Aggregate (VMA), % minimum					
	12.0	13.0	14.0	15.0	16.0
Plant-Produced Voids in the Mineral Aggregate (VMA), % minimum					
	11.0	12.0	13.0	14.0	15.0

Table 5
Laboratory Mixture Design Properties

Property	TxDOT Standard Laboratory Test Procedure	Required	
Target laboratory-molded density, %	Tex-207-F	96.5	Base, Binder, and Level Up Courses
		Surface or Wearing Courses	
		96.5	Primary and Secondary Arterials
		97.0	Collectors, Local Type B Streets, and Local Type A Street With Bus Traffic
		97.5	Local Type A Street Without Bus Traffic
Boil test ¹	Tex-530-C	–	

1. Used to establish baseline for comparison to production results. May be waived when approved.

Table 6
Hamburg Wheel Test Requirements¹

High-Temperature Binder Grade	Minimum # of Passes ² @ 0.5" Rut Depth, Tested @ 122°F
PG 64 or lower	5,000
PG 70	10,000
PG 76 or higher	20,000

1. Tested in accordance with Tex-242-F.

2. May be decreased if shown on the plans.

C. Job-Mix Formula. The laboratory mixture design shall be submitted to the Engineer for approval prior to production and placement. The submittal shall provide the laboratory

designed mixture target properties and data that demonstrate the contractor's ability to produce the mixture within the tolerances specified in Table 7 herein either through a trial batch or by submittal of previous production data from a City or TxDOT project.

Once approved, the contractor may begin production and placement of the approved JMF. Results from Lot 1 of the JMF may be used to modify the optimum mixture properties as long as the tested properties are within the tolerances specified in Table 7 herein. Further adjustments to the JMF may be allowed by the Engineer during production and placement, if warranted. JMF adjustment requests must be made in writing to the Engineer and the mixture must conform to the master gradation limits for the mixture type and be within the operational limits of Table 7 noted above for the initial JMF approved by the Engineer.

Table 7
Operational Tolerances

Description	Test Method	Allowable Difference from Current JMF Target
Individual % Retained for #8 Sieve or Larger	Tex-200-F or Tex-236-F	±5.0 ¹
Individual % Retained for Sieves Smaller than #8 and Larger than #200		±3.0 ¹
% Passing the #200 Sieve		±2.0 ¹
Asphalt Content, %	Tex-236-F	±0.3 ²
Laboratory-Molded Density, %	Tex-207-F	±1.0
VMA, % minimum		Note 3

Note 1: When within these tolerances, mixture production gradations may fall outside the master grading limits; however, the % passing the #200 sieve will be considered out of tolerance when outside the master grading limits.

Note 2: Tolerance between Laboratory Mix and Plant Trial Batch may exceed ±0.3.

Note 3: Test and verify that Table 4 requirements are met.

- D. Production.** Do not heat the asphalt binder above the temperatures specified in TxDOT Item 300, "Asphalts, Oils, and Emulsions," or outside the manufacturer's recommended values. Do not store an asphaltic mixture for a period long enough to affect the quality of the mixture, nor in any case longer than 12 hr.

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. The Engineer will not pay for, or allow placement of, any mixture produced at more than 350°F. Control the mixing time and temperature so that moisture is removed from the mixture before discharging from the plant. If requested, determine the moisture content by oven-drying in accordance with TxDOT standard laboratory test procedure 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.

Perform a new trial batch when the plant or plant location is changed. The Engineer may suspend production for noncompliance with this Item. Take corrective action and obtain approval to proceed after any production suspension for noncompliance.

- E. Tack Coat.** The surface upon which the tack coat is to be placed shall be cleaned thoroughly to the satisfaction of the Inspector. The surface shall be given a uniform application of tack coat using asphaltic materials of this specification. Unless otherwise shown on the plans, tack

coat shall be applied with an approved sprayer at a rate directed by the Engineer between 0.04 and 0.10 gallon residual asphalt per square yard of surface.

F. Transporting Asphaltic Concrete. The asphaltic mixture shall be hauled to the work site in vehicles previously cleaned of all foreign material and with beds that do not discharge or lose materials during the haul. Trucks that do not meet the satisfaction of the Engineer or Inspector will not be allowed to deliver materials to City projects. The dispatching of the vehicles shall be arranged so that all material is delivered, placed, and rolled during daylight hours unless otherwise shown on the plans. In cool weather, or for long hauls, covering and insulating of the truck bodies may be required. If necessary, to prevent the mixture from adhering to the inside of the truck body, the inside of the truck may be given a light coating of release agent satisfactory to the Engineer.

G. Placement.

1. Weather Conditions. Place mixture, when placed with a spreading and finishing machine, or the tack coat when the roadway surface temperature is 60°F or higher unless otherwise approved. Measure the roadway surface temperature with a handheld infrared thermometer. Place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable in the opinion of the Engineer.

The asphaltic mixture, when placed with a motor grader, shall not be placed when the surface temperature is below 65°F and is falling, but may be placed when the surface temperature is above 55°F and is rising. The maximum depth of asphalt mixture placed with a motor grader will not exceed 5 inches of compacted material.

Mat thicknesses of 1-½ inches and less shall not be placed when the temperature of the surface on which the mat is to be placed is below 60°F.

It is further provided that the tack coat or asphaltic mixture shall be placed only when the humidity, general weather conditions, temperature and moisture condition of the base are suitable.

2. Placement Temperature. If, after being discharged from the mixer and prior to placing, the temperature of the asphaltic mixture falls below 200°F, all or any part of the load may be rejected and payment will not be made for the rejected material.

3. Placement Operations. Placement and laydown operations shall be in conformance with this section and Section 205.4.H. - "Quality Control and Acceptance."

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.

The asphaltic mixture shall be dumped and spread on the approved prepared surface with the spreading and finishing machine. Place the mixture to meet the typical section requirements and produce a smooth, finished surface with a uniform appearance and texture. In addition, the placing of the asphaltic mixture shall be completed without tearing, shoving, gouging or segregating the mixture and without producing streaks in the mat.

Unloading into the finishing machine shall be controlled so that bouncing or jarring the spreading and finishing machine shall not occur and the required lines and grades shall be obtained without resorting to hand finishing.

When approved by the Engineer, level-up courses may be spread with a motor grader.

Construction joints of successive courses of asphaltic material shall be offset at least 6 inches. Construction joints on surface courses shall coincide with lane lines, or as directed by the Engineer.

The spreading and finishing machine shall be operated at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough that stopping between trucks is not ordinarily required. If, in the opinion of the Inspector, sporadic delivery of material is adversely affecting the mat, the Inspector may require paving operations to cease until acceptable methods are provided to minimize starting and stopping of the paver.

The hopper flow gates of the spreading and finishing machine shall be adjusted to provide an adequate and consistent flow of material. These shall result in enough material being delivered to the augers so that they are operating approximately 85 percent of the time or more. The augers shall provide means to supply adequate flow of material to the center of the paver. Augers shall supply an adequate flow of material for the full width of the mat, as approved by the Engineer. Augers should be kept approximately one-half to three-quarters full of mixture at all times during the paving operation.

When the asphaltic mixture is placed in a narrow strip along the edge of an existing pavement, or used to level up small areas of an existing pavement, or placed in small irregular areas where the use of a finishing machine is not practical, the finishing machine may be eliminated when authorized by the Engineer.

Adjacent to flush curbs, gutters and structures, the surface shall be finished uniformly high so that when compacted, it will be slightly above the edge of the curb or structure.

If a pattern of surface irregularities or segregation is detected, the Contractor shall make an investigation into the causes and immediately take the necessary action. With the approval of the Inspector, placement may continue for no more than one full production day from the time the Contractor is first notified and while corrective actions are being taken. If the problem still exists after that time, paving shall cease until the Contractor further investigates the causes and the Engineer approves further corrective action to be taken.

Place mixture within the compacted lift thickness shown in Table 8, unless otherwise shown on the plans or allowed.

Use the guidelines in Table 9 to establish the temperature of mixture delivered to the paver.

Table 8
Compacted Lift Thickness and Required Core Height

Mixture Type	Compacted Lift Thickness		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

Table 9
Suggested Minimum Mixture Placement Temperature

High-Temperature Binder Grade	Minimum Placement Temperature (Before Entering Paver)
PG 64 or lower	260°F
PG 70	270°F
PG 76	280°F
PG 82 or higher	290°F

4. **Compaction.** The pavement shall be compacted thoroughly and uniformly with the necessary rollers to obtain the compaction and cross section of the finished paving mixture meeting the requirements of the plans and specifications.

The edges of the pavement along curbs, headers and similar structures, and all places not accessible to the roller, or in such positions as will not allow thorough compaction with the rollers, shall be thoroughly compacted with lightly oiled tamps.

Rolling with a trench roller will be required on widened areas, in trenches and other limited areas where satisfactory compaction cannot be obtained with the approved rollers.

- a. **In-Place Compaction Control.** Use density control unless ordinary compaction control is specified on the plans. Use the control strip method given in Tex-207-F, Part IV, to establish the rolling pattern for density controlled areas.

Where specific density or air void requirements are waived, furnish and operate compaction equipment as approved.

Do not use pneumatic-tire rollers if excessive pickup of fines by roller tires occurs. Unless otherwise directed, use only water or an approved release agent on rollers, tamps, and other compaction equipment. Keep diesel, gasoline, oil, grease, and other foreign matter off the mixture.

When rolling with the three-wheel, tandem or vibratory rollers, it is recommended that rolling start by first rolling the joint with the adjacent pavement and then continue by rolling longitudinally at the sides and proceed toward the center of the pavement, overlapping on successive trips by at least 1 foot. Alternate trips of the roller should be slightly different in length. On super-elevated curves, rolling should begin at the low side and progress toward the high side.

When rolling with vibratory steel-wheel rollers, equipment operation shall be in accordance with Item 210, "Rolling", and the manufacturer's recommendations, unless otherwise directed by the Engineer. Vibratory rollers shall not be left vibrating

while not rolling or when changing directions. In addition, vibratory rollers shall not be allowed in the vibrating mode on mats with a plan depth of less than 1-½ inches, unless approved by the Engineer.

The motion of the rollers shall be slow enough to avoid other than usual initial displacement of the mixture. If any displacement occurs, it shall be corrected to the satisfaction of the Inspector. Ensure pavement is fully compacted before allowing rollers to stand on the pavement.

(1) Ordinary Compaction Control. One three-wheel roller, one pneumatic-tire roller, and one tandem roller shall be furnished for each compaction operation except as provided below or approved by the Engineer. The use of a tandem roller may be waived by the Engineer when the surface is already adequately smooth and further steel-wheel rolling is shown to be ineffective. With approval of the Engineer, the Contractor may substitute a vibratory roller for the three-wheel roller and/or the tandem roller. Use of at least one pneumatic-tire roller is required unless approved by the Engineer. Additional or heavier rollers shall be furnished if required by the Engineer.

Rolling patterns shall be established by the Contractor to achieve the maximum compaction. The selected rolling pattern shall be followed unless changes in the mixture or placement conditions occur which affect compaction. When changes in the mixture or placement conditions occur, a new rolling pattern shall be established.

(2) Density Compaction Control. Place and compact asphaltic concrete materials in accordance with the method specified in Section 205.4.H, “Quality Control and Acceptance.”

- 5. Compaction Cessation Temperature.** Regardless of the method required for in-place compaction control, all rolling for compaction shall be completed before the mixture temperature drops below 175°F.
- 6. Opening to Traffic.** 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.

If the surface ravel, flushes, ruts or deteriorates in any manner prior to final acceptance of the work, it will be the Contractor's responsibility to correct this condition at their expense, to the satisfaction of the Inspector and in conformance with the requirements of this specification.

H. Quality Control and Acceptance. Control and acceptance of hot mixed asphaltic concrete pavement shall be followed as specified herein or as directed on the plans. The contractor shall conduct production and placement operations in accordance with the method specified. All testing will be conducted in accordance with the testing methods shown in Table 10.

Table 10
Acceptable Production and Placement Testing Methods

Description	Test Method
Gradation including % passing the #200 sieve	Tex-200-F or Tex-236-F
Laboratory-molded density	Tex-207-F
VMA	
Laboratory-molded bulk specific gravity	
In-Place air voids	
Segregation (density profile)	Tex-207-F, Part V
Longitudinal joint density	Tex-207-F, Part VII
Moisture content	Tex-212-F, Part II
Theoretical maximum specific (Rice) gravity	Tex-227-F
Asphalt content	Tex-236-F
Hamburg Wheel test	Tex-242-F
Thermal profile	Tex-244-F
Asphalt binder sampling and testing ¹	Tex-500-C
Boil test ¹	Tex-530-C

1. The Engineer may waive the sampling and testing requirements at their discretion.

- 1. Production Sampling and Testing.** For a given project, sample asphaltic concrete materials at the production facility every 500 tons for each mixture type supplied or as directed by the Engineer. Unless otherwise shown on the plans, a production facility that supplies the same mixture to multiple City projects on the same day will not be required to sample and test at the required frequency for every project. A single test report may be used on two or more projects to represent the quality of the mixture for that day's production.

During production, do not exceed the operational tolerances in Table 7. Stop production if testing indicates tolerances are exceeded on:

- 3 consecutive tests on any individual sieve,
- 4 consecutive tests on any of the sieves, or
- 2 consecutive tests on asphalt content.

Suspend production and shipment of mixture if the asphalt content deviates from the current JMF by more than 0.5% for any test.

Begin production only when test results or other information indicate, to the satisfaction of the Engineer, that the next mixture produced will be within Table 7 tolerances.

The Contractor shall perform a Hamburg Wheel test at the direction of the Engineer at any time during production, including when the boil test indicates a change in quality from the materials submitted for the initial JMF. If the production sample fails the Hamburg Wheel test criteria in Table 6, 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 to be removed and replaced at the Contractor's expense.

If the Hamburg Wheel test results in a "remove and replace" condition, the Contractor may request that the Engineer confirm the results by retesting the failing material. An Independent laboratory retained by the Engineer will perform the Hamburg Wheel tests

and determine the final disposition of the material in question based on the initial test results.

2. Placement Sampling and Testing.

- a. **In-Place Density.** For every 500 tons of compacted asphaltic material or as directed by the Engineer, test the in place density. The in place density shall be in the range of 92.0% to 97.0% of the maximum density. Do not increase the asphalt content of the mixture to increase pavement density.

Unless otherwise shown on the plans, obtain 2 roadway specimens at each location selected by the Engineer for in-place density determination. Unless otherwise determined, the Engineer will witness the coring operation and measurement of the core thickness. Unless otherwise approved, obtain the cores within 1 working day after placement is completed. Obtain two 6 inch diameter cores side-by-side from within 1 foot of the location provided by the Engineer. For Type C, D and F mixtures, 4 inch diameter cores are allowed. Mark the cores for identification.

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 insure that an adequate bond will be achieved during subsequent placement operations.

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.

If the core heights exceed the minimum untrimmed values listed in Table 8, trim the cores within 1 working day following placement operations unless otherwise approved. If the core height before trimming is less than the minimum untrimmed value shown in Table 8, decide whether or not to include the pair of cores in the density determination for that subplot. If the cores are to be included in density determination, trim the cores. If the cores will not be included in density determination, store untrimmed cores for the Engineer.

The Engineer will measure density in accordance with Tex-207-F and Tex-227-F. Before drying to a constant weight, cores may be predried using a vacuum device, or by other methods approved by the Engineer, to remove excess moisture. The Engineer will use the average density of the 2 cores to calculate the in-place density at the selected location.

If the in-place density in the compacted mixture is below 92% or greater than 97%, change the production and placement operations to bring the in-place density within requirements. The Engineer may suspend production until the in-place density is brought to the required level, and may require a test section as described below, before proceeding.

At the onset of production, or after production and placement operations have been altered to bring the in-place density into conformance, construct a test section of 1 lane-width and at most 0.2 miles in length to demonstrate that compaction to between 92.0% and 97.0% in-place density can be obtained. Continue this procedure until a test section with the correct density can be produced. The Engineer will allow only 2

test sections per day. When a test section producing satisfactory in-place air void content is placed, resume full production.

- (1) **Shoulders and Ramps.** Shoulders and ramps are subject to in-place density testing, unless otherwise shown on the plans.
- (2) **Miscellaneous Areas.** Miscellaneous areas include areas that are not generally subject to primary traffic, such as driveways, mailbox turnouts, crossovers, gores, spot level-up areas, and other similar areas. Miscellaneous areas also include level-ups and thin overlays if the layer thickness designated on the plans is less than the compacted lift thickness shown in Table 8.

Miscellaneous areas will not be included in the in place density testing. Compact areas that are not subject to in-place air void determination in accordance with ordinary compaction control.

- b. **Segregation (Density Profile).** If shown on the plans, test for segregation using density profiles in accordance with Tex-207-F, Part V. Provide the Engineer with the results of the density profiles as they are completed. Areas defined as “Miscellaneous Areas,” are not subject to density profile testing.

If density profiles are required by the plans, perform a density profile every time the screed stops, on areas that are identified by either the Contractor or the Engineer as having thermal segregation, and on any visibly segregated areas. If the screed does not stop, and there are no visibly segregated areas or areas that are identified as having thermal segregation, perform a minimum of 1 profile per 500 tons of compacted material or as directed by the Engineer.

Reduce the test frequency to a minimum of 1 profile per 2,000 tons of compacted material, or as directed by the Engineer, if 4 consecutive profiles are within established tolerances. Continue testing at this frequency unless a profile fails, at which point resume testing at a minimum frequency of 1 per 500 tons or as directed by the Engineer. The Engineer may further reduce the testing frequency based on a consistent pattern of satisfactory results.

Unless otherwise shown on the plans, the density profile is considered failing if it exceeds the tolerances in Table 11. No production or placement bonus will be paid for any subplot that contains a failing density profile. The Engineer may make as many independent density profile verifications as deemed necessary. The Engineer’s density profile results will be used when available.

Investigate density profile failures and take corrective actions during production and placement to eliminate the segregation. Suspend production if 2 consecutive density profiles fail, unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

Table 11
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

c. Longitudinal Joint Density.

- (1) Informational Tests.** While establishing the rolling pattern, perform joint density evaluations and verify that the joint density is no more than 3.0 pounds per cubic foot 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.
- (2) Record Tests.** If shown on the plans, for each 500 tons of compacted material or as directed by the Engineer, perform a joint density evaluation at each pavement edge that is or will become a longitudinal joint. Determine the joint density in accordance with Tex-207-F, Part VII. Record the joint density information and submit results to the Engineer. The evaluation is considered failing if the joint density is more than 3.0 pounds per cubic foot below the density taken at the core random sample location and the correlated joint density is less than 90.0%. The Engineer may make independent joint density verifications at the random sample locations. The Engineer's joint density test results will be used when available.

Investigate joint density failures and take corrective actions during production and placement to improve the joint density. Suspend production if 2 consecutive evaluations fail unless otherwise approved. Resume production after the Engineer approves changes to production or placement methods.

- d. Recovered Asphalt DSR.** 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 Engineer. The aging ratio is the dynamic shear rheometer (DSR) value of the extracted binder divided by the DSR value of the original unaged binder (including RAP binder). DSR values are obtained according to AASHTO T 315 at the specified high temperature performance grade of the asphalt. The binder from RAP will be included proportionally as part of the original unaged binder. 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 using Tex-211-F.
- e. Irregularities.** Immediately take corrective action if surface irregularities, including but not limited to segregation, rutting, raveling, flushing, fat spots, mat slippage, color, texture, roller marks, tears, gouges, streaks, or uncoated aggregate particles, are detected.

The Engineer may allow placement to continue for at most 1 day of production while taking appropriate action. If the problem still exists after that day, suspend paving until the problem is corrected to the satisfaction of the Engineer.

At the expense of the Contractor and to the satisfaction of the Engineer, remove and replace any mixture that does not bond to the existing pavement or that has other surface irregularities identified above.

- 3. 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, 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 7, 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.
 - 4. Ride Quality.** When required by the plans, measure ride quality in accordance with TxDOT Standard Specification Item 585, "Ride Quality for Pavement Surfaces." Surface Test Type A or B as well as Pay Schedule 1, 2, or 3 shall also be indicated on the plans.
- 205.5. MEASUREMENT:** Hot Mix Asphaltic Concrete Pavement shall be measured by square yard, complete in place, for the thickness specified on the plans. Limits of payment will be from face of curb to face of curb. Pavement area shall not exceed the limits shown on the plans without written authorization.
- 205.6. PAYMENT:** The work performed and materials furnished, as described by this item and measured as provided herein, shall be paid for at the contract unit bid price per square yard specified on the plans of "Hot Mix Asphaltic Concrete Pavement," which price shall be full compensation for furnishing and placing all materials, and for all labor, tools, equipment, and incidentals necessary to complete the work. The prime coat and tack coat, when required, shall be paid under the provisions of Item Nos. 202 and 203, respectively.

Trial batches will not be paid for unless they are incorporated into pavement work approved by the Engineer.

Pay adjustment for ride quality, when required on the plans, will be determined in accordance with TxDOT Standard Specification Item 585, "Ride Quality for Pavement Surfaces."

205.7. BID ITEM:

Item 205.1 - Hot Mix Asphaltic Pavement Type A - per square yard __ inches pavement thickness

Item 205.2 - Hot Mix Asphaltic Pavement Type B - per square yard __ inches pavement thickness

Item 205.3 - Hot Mix Asphaltic Pavement Type C - per square yard __ inches pavement thickness

Item 205.4 - Hot Mix Asphaltic Pavement Type D - per square yard __ inches pavement thickness

Item 205.5 - Hot Mix Asphaltic Pavement Type F - per square yard __ inches pavement thickness

ITEM

413 FLOWABLE FILL

413.1. DESCRIPTION: *Furnish, mix, test and install flowable fill. Flowable fill is a concrete material suitable as a backfill for utility trenches, abandoned pipes, manholes and valves. It is a heavy material and will exert a high fluid pressure against any forms, embankment, or wall used to contain the backfill.*

413.2. MATERIALS:

- A. Cement.** Furnish hydraulic cement that meets the requirements of TxDOT's DMS-4600, "Hydraulic Cement," TxDOT's Hydraulic Cement Quality Monitoring Program (HCQMP), and ASTM C-150 Type I Portland Cement. Sources not on the HCQMP or other sources to be used in combination with an approved source will require approval before use.
- B. Fly Ash.** Furnish fly ash conforming to TxDOT DMS-4610, "Fly Ash."
- C. Chemical Admixtures.** Furnish chemical admixtures conforming to TxDOT DMS-4640, "Chemical Admixtures for Concrete."
- D. Fine Aggregate.** Provide fine aggregate that will stay in suspension in the mortar to the extent required for proper flow and that meets the gradation requirements of Table 1. Test fine aggregate gradation in accordance with TxDOT standard laboratory test procedure Tex-401-A. Plasticity Index (PI) must not exceed 6 when tested in accordance with TxDOT standard laboratory test procedure Tex-106-A.

Table 1
Aggregate Gradation Chart

Sieve Size	Percent Passing
¾ in.	100
No. 200	0–30

- E. Mixing Water.** Use mixing water conforming to the requirements of Item 300, "Concrete."

413.3. CONSTRUCTION: Submit a construction method and plan, including mix design and shrinkage characteristics of the mix, for approval. Provide a means of filling the entire void area, and be able to demonstrate that this has been accomplished. Prevent the movement of any inserted structure from its designated location. If voids are found in the fill or if any of the requirements are not met as shown on the plans, remove and replace or correct the problem without additional cost to the City.

Unless otherwise shown on the plans, furnish a mix meeting the requirements of Sections 413.3.A, "Strength," and 413.3.B, "Consistency."

- A. Strength.** The compressive strength range, when tested in accordance with TxDOT standard laboratory test procedure Tex-418-A, must be between the following strength values unless otherwise directed by the Engineer or shown on the plans:

- 1. **Low Strength.** Between 80 psi and 150 psi at 28 days,

- 2. High Strength.** Greater than 500 psi at 28 days. For emergency repairs, strength shall be greater than 50 psi at 2 hours.

Two specimens are required for a strength test, and the compressive strength is defined as the average of the breaking strength of the 2 cylinders.

- B. Consistency.** Design the mix to be placed without consolidation and to fill all intended voids. Fill an open-ended, 3 inch diameter by 6 inch high cylinder to the top to test the consistency. Immediately pull the cylinder straight up. The correct consistency of the mix must produce a minimum 8 inch diameter circular spread with no segregation.

When necessary, use specialty type admixtures to enhance the flowability, reduce shrinkage, and reduce segregation by maintaining solids in suspension. All admixtures must be used and proportioned in accordance with the manufacturer's recommendations.

Mix the flowable fill using a central-mixed concrete plant, ready-mix concrete truck, pug mill, or other approved method.

Furnish all labor, equipment, tools, containers, and molds required for sampling, making, transporting, curing, removal, and disposal of test specimens. Furnish test molds meeting the requirements of TxDOT standard laboratory test procedure Tex-447-A. Transport, strip, and cure the test specimens as scheduled at the designated location. Cure test specimens in accordance with TxDOT standard laboratory test procedure Tex-447-A. The Engineer will sample, make, and test all specimens. Dispose of used, broken specimens in an approved location and manner. The frequency of job control testing will be at the direction of the Engineer.

- C. Shrinkage and Bleeding.** Limit shrinkage to 0.5% or less based upon the results from ASTM C 827, "Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures."

413.4. MEASUREMENT: This Item will be measured by the cubic yard of material placed. Measurement will not include additional volume caused by slips, slides, or cave-ins resulting from the Contractor's operations.

413.5. 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 "Flowable Fill (Low Strength)," "Flowable Fill (High Strength)," or "Flowable Fill (High Strength emergency Repair)." This price is full compensation for furnishing, hauling, and placing materials and for equipment, tools, labor, and incidentals.

When shown on the plans or when other specifications indicate the use of flowable fill is incidental to another pay item, no direct payment for the material will be made.

413.6. BID ITEMS:

Item 413.1 - Flowable Fill (Low Strength) - per cubic yard

Item 413.2 - Flowable Fill (High Strength) - per cubic yard

Item 413.3 - Flowable Fill (High Strength Emergency Repair) - per cubic yard

ITEM

522 SIDEWALK PIPE RAILING

522.1. DESCRIPTION: *This item shall govern for furnishing and installation of railings for structures, in conformity with the lines, dimensions and details shown on the plans, and with the conditions of these specifications. This item shall include all connections, parts, and accessories, all required anchorage in the structures, headwalls, and wingwalls for proper anchorage of the post.*

522.2. MATERIALS:

A. Sidewalk Pipe Railing. Sidewalk pipe railing shall consist of two (2) horizontal steel pipe rails and vertical posts furnished and installed, complete on structures in conformity with the lines, diameters, dimensions and details shown on the plans and with the conditions of these specifications. This item shall include all connections, parts and accessories, all required anchorage in the structure concrete required for proper anchorage of the post. The pipe shall be of structural steel conforming to the requirements of the Standard Specifications for Steel for Bridges and Buildings, ASTM A 36, or approved equal.

B. Paint. Sidewalk pipe railing shall be painted with one (1) shop coat of primer, and two (2) field coats of aluminum paint. All paints and painting done under this item shall comply with the requirements as set forth under Item 514, "Paint and Painting."

522.3. EQUIPMENT: Provide the machinery, tools and equipment necessary for proper prosecution of the work. All machinery, tools and equipment used shall be maintained in a satisfactory and workmanlike manner.

522.4. CONSTRUCTION: Railing shall be constructed of the type specified, in accordance with details shown on the plans, and in conformance with the requirements herein specified. It shall be constructed to the alignment, grade and camber as designated on the plans. Shop fabricated railing shall be of such uniformity as to insure good joints and continuous lines after the falsework for the span has been released. The finished railing shall be rigidly fixed in position and true to line and free of scratches and other defects which would mar the appearance.

522.5. MEASUREMENT: "Sidewalk Pipe Railing," including all painting, anchorage, parts, and connections, in place in accordance with the plans and specifications, complete and accepted will be measured upon the face of the rail in place, from center to center of end post.

522.6. PAYMENT: Payment for railing, measured as prescribed above, will be made at the contract unit price bid per linear foot for "Sidewalk Pipe Railing," which price shall be full compensation for the furnishing of all labor, material, tools, equipment, and incidentals necessary to complete the work in accordance with the plans and specifications.

522.7. BID ITEM:

Item 522.1 - Sidewalk Pipe Railing - per linear foot

Item 465

Junction Boxes, Manholes, and Inlets



1. DESCRIPTION

Construct junction boxes, manholes, and inlets, complete in place or to the stage detailed, including furnishing and installing frames, grates, rings, and covers.

2. MATERIALS

Furnish materials in accordance with the following:

- Item 420, "Concrete Substructures,"
- Item 421, "Hydraulic Cement Concrete,"
- Item 440, "Reinforcement for Concrete," and
- Item 471, "Frames, Grates, Rings, and Covers."

Cast-in-place junction boxes, 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.

- 2.1. **Concrete.** Furnish Class H concrete as referenced in Item 421 "Hydraulic Cement Concrete," except that Mix Design Options 1–8 will be allowed for formed precast junction boxes, manholes, and inlets. Furnish concrete per [DMS-7310](#), "Reinforced Concrete Pipe and Machine-Made Precast Concrete Box Culvert Fabrication and Plant Qualification," for machine-made precast junction boxes, manholes, and inlets. Furnish Class C concrete for cast-in-place manholes and inlets unless otherwise shown on the plans.
- 2.2. **Mortar.** Furnish mortar conforming to [DMS-4675](#), "Cementitious Grouts and Mortars for Miscellaneous Applications."
- 2.3. **Timber.** Provide sound timber that is a minimum of 3 in. nominal thickness and reasonably free of knots and warps for temporary covers when used with Stage I construction (see Article 465.3., "Construction").
- 2.4. **Other Materials.** Use commercial-type hardware as approved.

3. CONSTRUCTION

Construct all types of junction boxes, manholes, and inlets either complete or in 2 stages, described as Stage I and Stage II.

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

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 for Stage I construction of cast iron or steel inlet units.

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

Construct the remaining wall height and top of junction box, manhole, or inlet for Stage II, and furnish and install any frames, grates, rings and covers, curb beams, or collecting basins required.

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

- 3.1. **Precast Junction Boxes, Manholes, and Inlets.** Construct formed precast junction boxes, manholes, and inlets in accordance with Item 420, "Concrete Substructures," except as otherwise noted in this Item. Construct machine-made precast junction boxes, manholes, and inlets in accordance with ASTM C478 except as otherwise noted in this Item. Mix and place concrete for machine-made junction boxes, manholes, and inlets per the requirements of [DMS-7310](#), "Reinforced Concrete Pipe and Machine-Made Precast Concrete Box Culvert Fabrication and Plant Qualification." Conform to the product permissible variations and rejection criteria stated in ASTM C478 for machine-made precast junction boxes, manholes, and inlets. Cure all precast units in accordance with Item 424, "Precast Concrete Structural Members (Fabrication)."

Multi-project fabrication plants as defined in Item 424 "Precast Concrete Structural Members (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 Junction Boxes, Manholes and Inlets." The Department's MPL has a list of approved multi-project plants.

- 3.1.1. **Lifting Holes.** Provide no more than 4 lifting holes in each section for precast units. 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. Cut no more than 5 in. in any direction of reinforcement per layer for lifting holes. Repair spalled areas around lifting holes.

- 3.1.2. **Marking.** Clearly mark each precast junction box, manhole, and inlet unit with the following information:
- name or trademark of fabricator and plant location;
 - product designation;
 - ASTM designation (if applicable);
 - date of manufacture;
 - designated fabricator's approval stamp; and
 - designation "SR" for product meeting sulfate-resistant concrete plan requirements (when applicable).

- 3.1.3. **Storage and Shipment.** Store precast units on a level surface. Do not ship units until design strength requirements have been met.

- 3.2. **Excavation, Shaping, Bedding, and Backfill.** Excavate, shape, bed, and backfill in accordance with Item 400, "Excavation and Backfill for Structures." Immediate backfilling is permitted for all junction box, manhole, and inlet structures where joints consist of rubber boots, rubber gaskets, or bulk or preformed joint sealant. Take precautions in placing and compacting the backfill to avoid any movement of junction boxes, manholes, and inlets. Remove and replace junction boxes, manholes, and inlets damaged by the Contractor at no expense to the Department.

- 3.3. **Junction Boxes, Manholes, and Inlets for Precast Concrete Pipe Storm Drains.** Construct junction boxes, manholes, and inlets for precast concrete pipe storm drains before completion of storm drain lines into or through the junction box, manhole, or inlet. Neatly cut all storm drains at the inside face of the walls of the junction box, manhole, or inlet.

- 3.4. **Junction Boxes, Manholes, and Inlets for Box Storm Drains.** Place bases or risers of junction boxes, manholes, and inlets for box storm drains before or in conjunction with placement of the storm drain. Backfill the junction box, manhole, or inlet and storm drain as a whole.

- 3.5. **Inverts.** Shape and route floor inverts passing out or through the junction box, manhole, or inlet as shown on the plans. Shape by adding and shaping mortar or concrete after the base is placed or by placing the required additional material with the base.

- 3.6. **Finishing Complete Junction Boxes, Manholes, and Inlets.** Complete junction boxes, manholes, and inlets in accordance with the plans. Backfill to original ground elevation in accordance with Item 400, "Excavation and Backfill for Structures."
- 3.7. **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."
- 3.8. **Stage II Construction.** Construct subgrade and base course or concrete pavement construction over Stage I junction box, manhole, or inlet construction unless otherwise approved. Excavate to expose the top of Stage I construction and complete the junction box, manhole or inlet in accordance with the plans and these Specifications, including backfill and cleaning of all debris from the bottom of the junction box, manhole, or inlet.
- 3.9. **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.

4. MEASUREMENT

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

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:

- 5.1. **Complete Manholes.** Payment for complete manholes will be made at the unit price bid for "Manhole (Complete)" of the type specified.
- 5.2. **Complete Inlets.** Payment for inlets will be made at the unit price bid for "Inlet (Complete)," of the type specified.
- 5.3. **Complete Junction Boxes.** Payment for junction boxes will be made at the unit price bid for "Junction Box (Complete)" of the type specified.
- 5.4. **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.
- 5.5. **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.
- 5.6. **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.
- 5.7. **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.
- 5.8. **Junction Boxes Stage I.** Payment for Junction Boxes, Stage I, will be made at the unit price bid for each "Junction Box (Stage I)" of the type specified.

- 5.9. **Junction Boxes Stage II.** Payment for Junction Boxes, Stage II, will be made at the unit price bid for each "Junction Box (Stage II)" of the type specified.
- This price is 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