| | |
|---|---|
| **Control** | **0912-72-541** |
| **Project** | **STP 2020(724)MM** |
| **Highway** | **CS** |
| **County** | **HARRIS** |

# ADDENDUM ACKNOWLEDGMENT

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

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

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

ADDENDUM NO. 1 ☐

ADDENDUM NO. 2 ☐

ADDENDUM NO. 3 ☐

ADDENDUM NO. 4 ☐

ADDENDUM NO. 5 ☐

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

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|---|---|
| **Control** | **0912-72-541** |
| **Project** | **STP 2020(724)MM** |
| **Highway** | **CS** |
| **County** | **HARRIS** |

# PROPOSAL TO THE TEXAS TRANSPORTATION COMMISSION

**2024 SPECIFICATIONS**

**WORK CONSISTING OF CONSTRUCT 4-LANE DIVIDED ROADWAY ON NEW ALIGNM**

**HARRIS COUNTY, TEXAS**

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

This project is to be completed in 305 working days and will be accepted when fully completed and finished to the satisfaction of the Executive Director or designee.

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

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

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

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

By signing the proposal the bidder certifies:

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

- **Signed: ****

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

**Print Name:**

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

**Title:**

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

**Company:**

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

- Signatures to comply with Item 2 of the specifications.

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

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

# NOTICE TO CONTRACTORS

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

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

# TEXAS DEPARTMENT OF TRANSPORTATION

# BID BOND

KNOW ALL PERSONS BY THESE PRESENTS,

That we, (Contractor Name) _____

_____

Hereinafter called the Principal, and (Surety Name) _____

_____

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

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

| | |
|---|---|
| **Control** | **0912-72-541** |
| **Project** | **STP 2020(724)MM** |
| **Highway** | **CS** |
| **County** | **HARRIS** |

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

Signed this _____ Day of _____ 20_____

By: _____

(Contractor/Principal Name)

_____

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

*By: _____

(Surety Name)

_____

(Signature of Attorney-in-Fact)

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

Impressed Surety Seal Only

**This form may be removed from the proposal.**

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# BIDDER'S CHECK RETURN

**IMPORTANT**

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

**NOTE**

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

RETURN BIDDERS CHECK TO (PLEASE PRINT):

| |
|---|
| |
| |
| |

| | |
|---|---|
| **Control** | **0912-72-541** |
| **Project** | **STP 2020(724)MM** |
| **Highway** | **CS** |
| **County** | **HARRIS** |

**IMPORTANT**

**PLEASE RETURN THIS SHEET IN ITS ENTIRETY**

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

Check Received By: _____ Date:_____

Title: _____

For (Contractor's Name): _____

Project _____ County_____

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# NOTICE TO THE BIDDER

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

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

**$_____**

**Total Bid Amount**

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

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

EXAMPLE

Total Bid Amount _____$2,664.00_____

Signed _____
Title _____
Date _____

Additional Signature for Joint Venture:

Signed _____
Title _____
Date _____

**EXAMPLE OF BID PRICES SUBMITTED BY COMPUTER PRINTOUT**

# EXAMPLES

## BID PRICES SUBMITTED BY HAND WRITTEN FORMAT

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

**Unit price for each plant in place**

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

**Unit price for each ton of Flexible Base**

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

**Unit price for each cubic yard of Concrete**

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

**Unit price of each Roadway Illumination Assembly**

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| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 100 | 7002 | | PREPARING ROW<br>DOLLARS<br>and CENTS | STA | 43.160 | 1 |
| | 104 | 7001 | | REMOV CONC (PAV)<br>DOLLARS<br>and CENTS | SY | 8,396.000 | 2 |
| | 104 | 7006 | | REMOV CONC (RIPRAP)<br>DOLLARS<br>and CENTS | SY | 5.000 | 3 |
| | 104 | 7011 | | REMOV CONC (DRIVEWAYS)<br>DOLLARS<br>and CENTS | SY | 175.000 | 4 |
| | 104 | 7013 | | REMOV CONC (SIDEWALK, RAMP OR SUP)<br>DOLLARS<br>and CENTS | SY | 314.000 | 5 |
| | 110 | 7001 | | EXCAV (ROADWAY)<br>DOLLARS<br>and CENTS | CY | 9,817.600 | 6 |
| | 110 | 7002 | | EXCAV (CHANNEL)<br>DOLLARS<br>and CENTS | CY | 17,175.500 | 7 |
| | 132 | 7012 | | EMBANK (FNL)(DC)(TY D)<br>DOLLARS<br>and CENTS | CY | 7,794.100 | 8 |
| | 161 | 7002 | | COMPOST MANUF TOPSOIL (4")<br>DOLLARS<br>and CENTS | SY | 37,158.000 | 9 |
| | 161 | 7006 | | EROSION CONTROL COMPOST (4")<br>DOLLARS<br>and CENTS | SY | 11,822.000 | 10 |
| | 161 | 7011 | | GENERAL USE COMPOST (2")<br>DOLLARS<br>and CENTS | SY | 1,503.000 | 11 |
| | 162 | 7002 | | BLOCK SODDING<br>DOLLARS<br>and CENTS | SY | 37,158.000 | 12 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 168 | 7001 | | VEGETATIVE WATERING<br>DOLLARS<br>and CENTS | TGL | 915.000 | 13 |
| | 170 | 7002 | | IRRIGATION SYSTEM (TY I)<br>DOLLARS<br>and CENTS | EA | 1.000 | 14 |
| | 170 | 7003 | | IRRIGATION SYSTEM (TY II)<br>DOLLARS<br>and CENTS | EA | 1.000 | 15 |
| | 192 | 7007 | | SOIL AMEND<br>DOLLARS<br>and CENTS | SY | 11,822.000 | 16 |
| | 192 | 7008 | | SOIL AMEND (TY I)<br>DOLLARS<br>and CENTS | SY | 11,822.000 | 17 |
| | 192 | 7009 | | PLANT BED PREP<br>DOLLARS<br>and CENTS | SY | 11,149.000 | 18 |
| | 192 | 7016 | | LANDSCAPE EDGE<br>DOLLARS<br>and CENTS | LF | 195.000 | 19 |
| | 192 | 7028 | | PLANT MATERIAL (3 GAL)<br>DOLLARS<br>and CENTS | EA | 530.000 | 20 |
| | 192 | 7029 | | PLANT MATERIAL (5 GAL)<br>DOLLARS<br>and CENTS | EA | 400.000 | 21 |
| | 192 | 7030 | | PLANT MATERIAL (15 GAL)<br>DOLLARS<br>and CENTS | EA | 250.000 | 22 |
| | 192 | 7031 | | PLANT MATERIAL (30 GAL)<br>DOLLARS<br>and CENTS | EA | 350.000 | 23 |
| | 192 | 7033 | | PLANT MATERIAL (65 GAL)<br>DOLLARS<br>and CENTS | EA | 50.000 | 24 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 192 | 7062 | | PLANT MATERIAL (MIN 8' TRNK HT)<br>DOLLARS<br>and CENTS | EA | 1,265.000 | 25 |
| | 192 | 7085 | | SOIL AMEND (TY III)<br>DOLLARS<br>and CENTS | SY | 4,200.000 | 26 |
| | 192 | 7086 | | SOIL AMEND (TY IV)<br>DOLLARS<br>and CENTS | SY | 5,479.000 | 27 |
| | 192 | 7087 | | SOIL AMEND (TY V)<br>DOLLARS<br>and CENTS | SY | 3,653.000 | 28 |
| | 260 | 7005 | | LIME (COM OR QK)(SLURRY)<br>DOLLARS<br>and CENTS | TON | 495.050 | 29 |
| | 260 | 7007 | | LIME TRT (EXIST MATL)(8")<br>DOLLARS<br>and CENTS | SY | 27,503.000 | 30 |
| | 360 | 7094 | | CONC PAV (JOINT REINF) (10")<br>DOLLARS<br>and CENTS | SY | 24,180.000 | 31 |
| | 400 | 7010 | | CEM STABIL BKFL<br>DOLLARS<br>and CENTS | CY | 9,367.000 | 32 |
| | 400 | 7011 | | CEMENT STAB BACKFILL (INLET OR MH)<br>DOLLARS<br>and CENTS | CY | 386.000 | 33 |
| | 402 | 7001 | | TRENCH EXCAVATION PROTECTION<br>DOLLARS<br>and CENTS | LF | 10,638.000 | 34 |
| | 420 | 7022 | | CL C CONC (CAP)<br>DOLLARS<br>and CENTS | CY | 1.700 | 35 |
| | 432 | 7001 | | RIPRAP (CONC)(4 IN)<br>DOLLARS<br>and CENTS | CY | 27.000 | 36 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 432 | 7002 | | RIPRAP (CONC)(5 IN)<br>DOLLARS<br>and CENTS | CY | 83.000 | 37 |
| | 432 | 7003 | | RIPRAP (CONC)(6 IN)<br>DOLLARS<br>and CENTS | CY | 5.300 | 38 |
| | 432 | 7022 | | RIPRAP (STONE TY R)(DRY)(8 IN)<br>DOLLARS<br>and CENTS | CY | 153.000 | 39 |
| | 462 | 7001 | | CONC BOX CULV (3 FT X 2 FT)<br>DOLLARS<br>and CENTS | LF | 484.000 | 40 |
| | 462 | 7027 | | CONC BOX CULV (9 FT X 5 FT)<br>DOLLARS<br>and CENTS | LF | 2,280.000 | 41 |
| | 464 | 7005 | | RC PIPE (CL III)(24 IN)<br>DOLLARS<br>and CENTS | LF | 1,050.000 | 42 |
| | 464 | 7007 | | RC PIPE (CL III)(30 IN)<br>DOLLARS<br>and CENTS | LF | 103.000 | 43 |
| | 464 | 7009 | | RC PIPE (CL III)(36 IN)<br>DOLLARS<br>and CENTS | LF | 507.000 | 44 |
| | 464 | 7010 | | RC PIPE (CL III)(42 IN)<br>DOLLARS<br>and CENTS | LF | 369.000 | 45 |
| | 464 | 7011 | | RC PIPE (CL III)(48 IN)<br>DOLLARS<br>and CENTS | LF | 851.000 | 46 |
| | 464 | 7012 | | RC PIPE (CL III)(54 IN)<br>DOLLARS<br>and CENTS | LF | 193.000 | 47 |
| | 465 | 7136 | | INLET (COMPL)(PSL)(FG)(5FTX5FT-3FTX-5FT)<br>DOLLARS<br>and CENTS | EA | 2.000 | 48 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 465 | 7286 | | JUNCT BOX (COMPL)(JB)(5FT X 5FT)(FTW)<br>DOLLARS<br>and CENTS | EA | 2.000 | 49 |
| | 465 | 7295 | | JUNCT BOX (COMPL)(JB)(7FT X 7FT)(FTW)<br>DOLLARS<br>and CENTS | EA | 2.000 | 50 |
| | 465 | 7312 | | INLET (COMPL)(CURB)(TY C1)(BOTH)(HOU)<br>DOLLARS<br>and CENTS | EA | 16.000 | 51 |
| | 465 | 7314 | | INLET (COMPL)(TY AD)(HOU)<br>DOLLARS<br>and CENTS | EA | 4.000 | 52 |
| | 465 | 7320 | | MANH (COMPL)(TY A)(HOU)<br>DOLLARS<br>and CENTS | EA | 9.000 | 53 |
| | 466 | 7147 | | WINGWALL (FW - 0) (HW=5 FT)<br>DOLLARS<br>and CENTS | EA | 5.000 | 54 |
| | 466 | 7176 | | WINGWALL (PW - 1) (HW=6 FT)<br>DOLLARS<br>and CENTS | EA | 1.000 | 55 |
| | 467 | 7322 | | SET (TY II) (24 IN) (CMP) (4: 1) (C)<br>DOLLARS<br>and CENTS | EA | 4.000 | 56 |
| | 479 | 7001 | | ADJUSTING MANHOLES<br>DOLLARS<br>and CENTS | EA | 2.000 | 57 |
| | 496 | 7002 | | REMOV STR (INLET)<br>DOLLARS<br>and CENTS | EA | 5.000 | 58 |
| | 496 | 7003 | | REMOV STR (MANHOLE)<br>DOLLARS<br>and CENTS | EA | 6.000 | 59 |
| | 496 | 7007 | | REMOV STR (PIPE)<br>DOLLARS<br>and CENTS | LF | 1,486.000 | 60 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 500 | 7001 | | MOBILIZATION<br>DOLLARS<br>and CENTS | LS | 1.000 | 61 |
| | 502 | 7001 | | BARRICADES, SIGNS AND TRAFFIC HANDLING<br>DOLLARS<br>and CENTS | MO | 20.000 | 62 |
| | 506 | 7002 | | ROCK FILTER DAMS (INSTALL) (TY 2)<br>DOLLARS<br>and CENTS | LF | 445.000 | 63 |
| | 506 | 7011 | | ROCK FILTER DAMS (REMOVE)<br>DOLLARS<br>and CENTS | LF | 445.000 | 64 |
| | 506 | 7020 | | CONSTRUCTION EXITS (INSTALL) (TY 1)<br>DOLLARS<br>and CENTS | SY | 312.000 | 65 |
| | 506 | 7024 | | CONSTRUCTION EXITS (REMOVE)<br>DOLLARS<br>and CENTS | SY | 312.000 | 66 |
| | 506 | 7039 | | TEMP SEDMT CONT FENCE (INSTALL)<br>DOLLARS<br>and CENTS | LF | 4,038.000 | 67 |
| | 506 | 7041 | | TEMP SEDMT CONT FENCE (REMOVE)<br>DOLLARS<br>and CENTS | LF | 4,038.000 | 68 |
| | 506 | 7042 | | BIODEG EROSN CONT LOGS (INSTL) (6")<br>DOLLARS<br>and CENTS | LF | 544.000 | 69 |
| | 506 | 7046 | | BIODEG EROSN CONT LOGS (REMOVE)<br>DOLLARS<br>and CENTS | LF | 544.000 | 70 |
| | 508 | 7001 | | CONSTRUCTING DETOURS<br>DOLLARS<br>and CENTS | SY | 342.000 | 71 |
| | 529 | 7006 | | CONC CURB (MONO) (TY I)<br>DOLLARS<br>and CENTS | LF | 327.000 | 72 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 529 | 7007 | | CONC CURB (MONO) (TY II)<br>DOLLARS<br>and CENTS | LF | 14,893.000 | 73 |
| | 530 | 7006 | | DRIVEWAYS (CONC)<br>DOLLARS<br>and CENTS | SY | 416.000 | 74 |
| | 531 | 7003 | | CONC SIDEWALKS (6")<br>DOLLARS<br>and CENTS | SY | 4,774.000 | 75 |
| | 531 | 7005 | | CURB RAMPS (TY 1)<br>DOLLARS<br>and CENTS | EA | 2.000 | 76 |
| | 531 | 7011 | | CURB RAMPS (TY 10)<br>DOLLARS<br>and CENTS | EA | 1.000 | 77 |
| | 531 | 7013 | | CURB RAMPS (TY 21)<br>DOLLARS<br>and CENTS | EA | 1.000 | 78 |
| | 618 | 7054 | | CONDT (PVC) (SCH 80) (2")<br>DOLLARS<br>and CENTS | LF | 6,828.000 | 79 |
| | 618 | 7055 | | CONDT (PVC) (SCH 80) (2") (BORE)<br>DOLLARS<br>and CENTS | LF | 391.000 | 80 |
| | 624 | 7008 | | GROUND BOX TY D (162922)W/APRON<br>DOLLARS<br>and CENTS | EA | 28.000 | 81 |
| | 644 | 7001 | | IN SM RD SN SUP&AM TY10BWG(1)SA(P)<br>DOLLARS<br>and CENTS | EA | 22.000 | 82 |
| | 662 | 7066 | | WK ZN PAV MRK REMOV (W)6"(DOT)<br>DOLLARS<br>and CENTS | LF | 235.000 | 83 |
| | 662 | 7068 | | WK ZN PAV MRK REMOV (W)6"(SLD)<br>DOLLARS<br>and CENTS | LF | 1,465.000 | 84 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 662 | 7099 | | WK ZN PAV MRK REMOV (Y)6"(DOT)<br>DOLLARS<br>and CENTS | LF | 378.000 | 85 |
| | 662 | 7100 | | WK ZN PAV MRK REMOV (Y)6"(SLD)<br>DOLLARS<br>and CENTS | LF | 8,285.000 | 86 |
| | 666 | 7236 | | RE PM TY III (W)(6")(SLD)<br>DOLLARS<br>and CENTS | LF | 1,174.000 | 87 |
| | 666 | 7237 | | RE PM TY III (W)(6")(BRK)<br>DOLLARS<br>and CENTS | LF | 1,605.000 | 88 |
| | 666 | 7238 | | RE PM TY III (W)(6")(DOT)<br>DOLLARS<br>and CENTS | LF | 510.000 | 89 |
| | 666 | 7239 | | RE PM TY III (W)(8")(SLD)<br>DOLLARS<br>and CENTS | LF | 378.000 | 90 |
| | 666 | 7241 | | RE PM TY III (W)(8")(DOT)<br>DOLLARS<br>and CENTS | LF | 164.000 | 91 |
| | 666 | 7242 | | RE PM TY III (W)(12")(SLD)<br>DOLLARS<br>and CENTS | LF | 66.000 | 92 |
| | 666 | 7244 | | RE PM TY III (W)(24")(SLD)<br>DOLLARS<br>and CENTS | LF | 134.000 | 93 |
| | 666 | 7248 | | RE PM TY III (Y)(6")(SLD)<br>DOLLARS<br>and CENTS | LF | 6,504.000 | 94 |
| | 666 | 7252 | | RE PM TY III (Y)(12")(SLD)<br>DOLLARS<br>and CENTS | LF | 216.000 | 95 |
| | 666 | 7254 | | RE PM TY III (W)(ARROW)<br>DOLLARS<br>and CENTS | EA | 6.000 | 96 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 666 | 7257 | | RE PM TY III (W)(WORD)<br>DOLLARS<br>and CENTS | EA | 10.000 | 97 |
| | 666 | 7259 | | RE PM TY III (W)(18" YLD TRI)<br>DOLLARS<br>and CENTS | EA | 24.000 | 98 |
| | 672 | 7002 | | REFL PAV MRKR TY I-C<br>DOLLARS<br>and CENTS | EA | 79.000 | 99 |
| | 677 | 7001 | | ELIM EXT PM & MRKS (4")<br>DOLLARS<br>and CENTS | LF | 321.000 | 100 |
| | 678 | 7002 | | PAV SURF PREP FOR MRK (6")<br>DOLLARS<br>and CENTS | LF | 9,793.000 | 101 |
| | 678 | 7004 | | PAV SURF PREP FOR MRK (8")<br>DOLLARS<br>and CENTS | LF | 542.000 | 102 |
| | 678 | 7006 | | PAV SURF PREP FOR MRK (12")<br>DOLLARS<br>and CENTS | LF | 282.000 | 103 |
| | 678 | 7008 | | PAV SURF PREP FOR MRK (24")<br>DOLLARS<br>and CENTS | LF | 134.000 | 104 |
| | 678 | 7009 | | PAV SURF PREP FOR MRK (ARROW)<br>DOLLARS<br>and CENTS | EA | 6.000 | 105 |
| | 678 | 7016 | | PAV SURF PREP FOR MRK (WORD)<br>DOLLARS<br>and CENTS | EA | 10.000 | 106 |
| | 678 | 7022 | | PAV SURF PREP FOR MRK (18")(YLD TRI)<br>DOLLARS<br>and CENTS | EA | 24.000 | 107 |
| | 752 | 7005 | | TREE REMOVAL (4" - 12" DIA)<br>DOLLARS<br>and CENTS | EA | 23.000 | 108 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 7004 | 7007 | | WATER MAIN PIPE (PVC)(C900)(12 IN)<br>DOLLARS<br>and CENTS | LF | 3,327.000 | 109 |
| | 7004 | 7011 | | WTR MAIN PIPE (PVC)(RESTRAINED JT)12IN<br>DOLLARS<br>and CENTS | LF | 501.000 | 110 |
| | 7004 | 7019 | | JCK TUN BOR AUG CASING (STL)(24 IN)<br>DOLLARS<br>and CENTS | LF | 197.000 | 111 |
| | 7004 | 7023 | | CASING STEEL (20 IN)<br>DOLLARS<br>and CENTS | LF | 501.000 | 112 |
| | 7004 | 7030 | | FIRE HYDRANT ASSEMBLY<br>DOLLARS<br>and CENTS | EA | 13.000 | 113 |
| | 7004 | 7034 | | GATE VALVE (12 IN)<br>DOLLARS<br>and CENTS | EA | 4.000 | 114 |
| | 7004 | 7040 | | TAPPING SLEEVE & VALVE (12IN X 12IN)<br>DOLLARS<br>and CENTS | EA | 1.000 | 115 |
| | 7004 | 7041 | | AIR RELEASE/VAC RELEASE VALVE (2IN)<br>DOLLARS<br>and CENTS | EA | 6.000 | 116 |
| | 7004 | 7047 | | WET CONNECTION (12 IN)<br>DOLLARS<br>and CENTS | EA | 2.000 | 117 |
| | 7006 | 7017 | | REMOVE EXIST SAN SWR PIPE (10 IN)<br>DOLLARS<br>and CENTS | LF | 119.000 | 118 |
| | 7006 | 7031 | | SANITARY SEWER (PVC)(SDR26)(15 IN)<br>DOLLARS<br>and CENTS | LF | 2,966.000 | 119 |
| | 7006 | 7039 | | MANHOLE (SAN SWR)(4 FT DIA)<br>DOLLARS<br>and CENTS | EA | 10.000 | 120 |

| ALT | ITEM-CODE | | | UNIT BID PRICE ONLY. WRITTEN IN WORDS | UNIT | APPROX QUANTITIES | DEPT USE ONLY |
|---|---|---|---|---|---|---|---|
| | ITEM NO | DESC CODE | S.P. NO. | | | | |
| | 7006 | 7040 | | SAN SWR CONNECTION TO EXIST MAN-HOLE<br>DOLLARS<br>and CENTS | EA | 1.000 | 121 |
| | 7006 | 7041 | | BYPASS PUMPING<br>DOLLARS<br>and CENTS | LS | 1.000 | 122 |
| | 7006 | 7042 | | REMOVE EXIST SAN SWR PIPE (4 IN)<br>DOLLARS<br>and CENTS | LF | 106.000 | 123 |

# CERTIFICATION OF INTEREST IN OTHER BID PROPOSALS FOR THIS WORK

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

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

_____ YES

_____ NO

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

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

# DISCLOSURE OF LOBBYING ACTIVITIES

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

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

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

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

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

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

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

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

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

| FEDERAL USE ONLY | Authorized for Local Reproduction<br>Standard Form - LLL |
|---|---|

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

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

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

Public reporting burdon for this collection of infromation is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments reguarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burdon, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

# DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB

0348-0046

## CONTINUATION SHEET

Reporting Entity: _____ Page _____ of _____

# CONTRACTOR'S ASSURANCE

(Subcontracts-Federal Aid Projects)

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

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

# ENGINEER SEAL

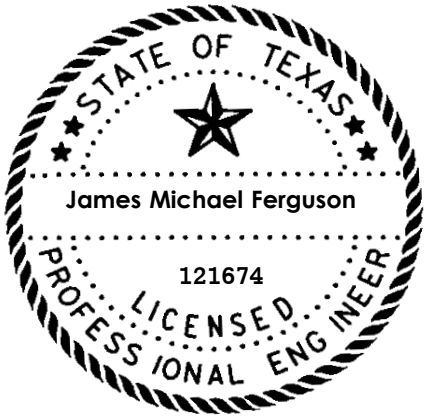
**Control** **0912-72-541**

**Project** **STP 2020(724)MM**

**Highway** **CS**

**County** **HARRIS**

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




**The seal appearing on this document was authorized by**

*James Michael Ferguson, P.E.*

**AUGUST 08, 2024**

**County:** Harris **Control:** 0912-72-541

**Highway:** CS

**General Notes:**

**General:**
Area Engineer contact information for this project follows:

*Jamal Elahi, P.E. – Jamal.Elahi@TxDOT.gov – 281-464-5501*
*Vanessa Bosques, P.E. – Vanessa.Bosques@TxDOT.gov*

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

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

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

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

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

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

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

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

The following standard detail sheets are modified:

**Modified Standards**

*FW-(0) MOD*

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

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

Grade street intersections and median openings for surface drainage.

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

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

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

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

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

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

Unless otherwise shown on the plans or otherwise directed, commence work after sunrise and ensure construction equipment is off the road by sunset.

Procure permits and licenses, which are to be issued by the city, county, or Municipal Utility District (MUD).

**General: Roadway Illumination and Electrical**

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

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

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

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

**General: Site Management**

Mow the grass and weeds within the project limits a maximum of 3 times a year as directed. This work is subsidiary to the various bid items.

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

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

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

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

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

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

**County:** Harris **Control:** 0912-72-541

**Highway:** CS

**General: Traffic Control and Construction**

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

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

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

If relocating mailboxes, place them with the post firmly in the ground at nearby locations. Upon completing the project, the Engineer will locate the final mailbox placement. Perform this work in accordance with the requirements of the Item, "Mailbox Assemblies," except for measurement and payment. This work is subsidiary to the various bid items.

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

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

**General: Utilities**

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

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

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

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

**County:** Harris **Control:** 0912-72-541

**Highway:** CS

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

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

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

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

| **Utility Company** | **Contact Name** | **Phone Number** |
|---|---|---|
| CenterPoint Energy – Gas | Jose De Los Reyes | (713) 207-4617 |
| CenterPoint Energy – Electric | Jose De Los Reyes | (713) 207-4617 |
| Kinder Morgan | Oscar Zapata | (713) 420-4654 |
| Phonoscope | Ruel Cabungcal | (832) 760-6549 |
| Comcast/ AT&T | Alex Miller | (346) 413-3689 |
| Frontier/Verizon | Joshua May | (346) 203-2616 |
| City of Webster | David Glasco | (281) 316-4139 |
| City of League City | Christopher Sims | (281)554-1440 |

**Item 5: Control of Work**

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

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

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

**County:** Harris **Control:** 0912-72-541

**Highway:** CS

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

**Table 2**

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

| Spec Item No.'s | Product | Submittal Required | Approval Required (Y/N) | Contractor/ Fabricator P.E. Seal Required | Reviewing Party | Shop or Working Drawing (Note 1) |
|---|---|---|---|---|---|---|
| 7.16.1&.2 | Construction Load Analyses | Y | Y | Y | D | WD |
| 400 | Excavation and Backfill for Structures (cofferdams) | Y | N | Y | D | WD |
| 403 | Temporary Special Shoring | Y | N | Y | D | WD |
| 420 | Formwork/Falsework | Y | N | Y | D | WD |
| 423 | Retaining Walls, (calcs req'd.) | Y | Y | Y | D | SD |
| 425 | Optional Design Calculations (Prstrs Bms) | Y | Y | Y | D | SD |
| 425 | Prestr Concr Sheet Piling | Y | Y | N | D | SD |
| 425 | Prestr Concr Beams | Y | Y | N | D | SD |
| 425 | Prestr Concr Bent | Y | Y | N | D | SD |
| 426 | Post Tension Details | Y | Y | N | D | SD |
| 434 | Elastomeric Bearing Pads (All) | Y | Y | N | D | SD |
| 441 | Bridge Protective Assembly | Y | Y | N | D | SD |
| 441 | Misc Steel (various steel assemblies) | Y | Y | N | D | SD |
| 441 | Steel Pedestals (bridge raising) | Y | Y | N | D | SD |
| 441 | Steel Bearings | Y | Y | N | D | SD |
| 441 | Steel Bent | Y | Y | N | D | SD |
| 441 | Steel Diaphragms | Y | Y | N | D | SD |
| 441 | Steel Finger Joint | Y | Y | N | D | SD |
| 441 | Steel Plate Girder | Y | Y | N | D | SD |
| 441 | Steel Tub-Girders | Y | Y | N | D | SD |
| 441 | Erection Plans, including Falsework | Y | N | Y | D | WD |
| 449 | Sign Structure Anchor Bolts | Y | Y | N | D | SD |
| 450 | Railing | Y | Y | N | D | SD |
| 462 | Concrete Box Culvert | Y | Y | N | D | SD |
| 462 | Concrete Box Culvert (Alternate Designs Only,calcs reqd.) | Y | Y | Y | D | SD |
| 464 | Reinforced Concrete Pipe (Jack and Bore only; ONLY when requested) | Y | Y | Y | D | SD |
| 465 | Pre-cast Junction Boxes, Grates, and Inlets | Y | Y | N | D | SD |
| 465 | Pre-cast Junction Boxes, Grates, and Inlets (Alternate Designs Only, calcs req'd.) | Y | Y | Y | D | SD |
| 466 | Pre-cast Headwalls and Wingwalls | Y | Y | N | D | SD |
| 467 | Pre-cast Safety End Treatments | Y | Y | N | D | SD |

| | | | | | | |
|---|---|---|---|---|---|---|
| 495 | Raising Existing Structure (calcs reqd.) | Y | Y | Y | D | SD |
| 610 | Roadway Illumination Supports (Non-Standard only, calcs reqd.) | Y | Y | Y | D | SD |
| 613 | High Mast Illumination Poles (Non-standard only, calcs reqd.) | Y | Y | Y | D | SD |
| 627 | Treated Timber Poles | Y | Y | N | D | SD |
| 644 | Special Non-Standard Supports (Bridge Mounts, Barrier Mounts, Etc.) | Y | Y | Y | D | SD |
| 647 | Large Roadside Sign Supports | Y | Y | Y | D | SD |
| 650 | Cantilever Sign Structure Supports - Alternate Design Calcs. | Y | Y | Y | D | SD |
| 650 | Sign Structures | Y | Y | N | D | SD |
| 680 | Installation of Highway Traffic Signals | Y | Y | N | D | SD |
| 682 | Vehicle and Pedestrian Signal Heads | Y | Y | N | D | SD |
| 684 | Traffic Signal Cables | Y | Y | N | D | SD |
| 685 | Roadside Flashing Beacon Assemblies | Y | Y | N | D | SD |
| 686 | Traffic Signal Pole Assemblies (Steel) (Non-Standard only) | Y | Y | Y | D | SD |
| 687 | Pedestal Pole Assemblies | Y | Y | N | D | SD |
| 688 | Detectors | Y | Y | N | D | SD |
| 784 | Repairing Steel Bridge Members | Y | Y | Y | D | WD |
| SS | Prestr Concr Crown Span | Y | Y | N | D | SD |
| SS | Sound Barrier Walls | Y | Y | Y | D | SD |
| SS | Camera Poles | Y | Y | Y | TMS | SD |
| SS | Pedestrian Bridge (Calcs req'd.) | Y | Y | Y | D | SD |
| SS | Screw-In Type Anchor Foundations | Y | Y | N | D | SD |
| SS | Fiber Optic/Communication Cable | Y | Y | N | TMS | SD |
| SS | Spread Spectrum Radios for Signals | Y | Y | N | D | SD |
| SS | VIVDS System for Signals | Y | Y | N | D | SD |
| SS | CTMS Equipment | Y | Y | N | TMS | SD |

Notes:

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

**Key to Reviewing Party**

| |
|---|
| D – Consultant: Submit to Engineer of Record at jb.ferguson@freese.com |
| TMS – Traffic Management System |

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

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-

publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

**Item 6: Control of Materials**

To comply with the latest provisions of the Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the Contractor must submit an original of the TxDOT Construction Material Buy America Certification Form for items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

The Buy America Material Classification Sheet is located at the below link.

https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

**Item 7: Legal Relations and Responsibilities**

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

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

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

1. **Restricted Use of Materials for the Previously Evaluated Permit Areas.** Document both the Project Specific Locations (PSL) and their authorization.

Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:

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

2. **Contractor Materials from Areas Other than Previously Evaluated Areas.** Provide the Department with a copy of USACE coordination or approvals before initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites:
   a. The Item, "Embankment" used for temporary or permanent fill within a USACE permit area.
   b. Unsuitable excavation or excess excavation, "Waste" (under the Item, "Excavation"), that is disposed of outside a USACE evaluated area.

The total area disturbed for this project is 14 acres. The disturbed area in this project, the project locations in the contract, and Contractor project specific locations (PSLs) within 1 mile of the project limits for the contract, will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer (to the appropriate MS4 operator when on an off-state system route) and to the local government that operates a separate storm drain system.

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

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

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

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

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

Roadway closures during the following key dates and special events are prohibited:

*May X-X – Clear Creek ISD Graduation Ceremonies*

**Item 8: Prosecution and Progress**

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

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

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

Working days will be computed and charged based on a *standard* workweek in accordance with Section 8.3.1.*4.*

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

**Item 100: Preparing Right of Way**

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

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

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

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

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

**Item 104: Removing Concrete**

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

**Item 110: Excavation**

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

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

**Item 132: Embankment**

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

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

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

For unpaved areas, provide a finished grade with the top 4 in. capable of sustaining vegetation. Use fertile soil that is easily cultivated, free from objectionable material and highly resistant to erosion. Topsoil work is paid under the Item, "Topsoil."

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

**Item 161: Compost**
**Item 162: Sodding for Erosion Control**
**Item 166: Fertilizer**
**Item 168: Vegetative Watering**

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

**Item 260: Lime Treatment (Road-Mixed)**

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

The Engineer will observe the lime treatment that the Contractor elects to open to construction traffic immediately after compaction. If the construction traffic damages the subgrade, route the traffic off the damaged section in accordance with the standard specification. If the construction traffic does not damage the subgrade, cure the subgrade until other courses of material cover it. Apply these courses within 14 days with a maximum curing period of 7 days.

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

Use the type of lime at particular locations as directed.

Place the quicklime dry or as a slurry.

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

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

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

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

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

**Item 360: Concrete Pavement**

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

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

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

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

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

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

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

Do not use limestone dust of fracture as fine aggregate.

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

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

**Item 360: Concrete Pavement**
**Item 420: Concrete Substructures**

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

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

**Item 400: Excavation and Backfill for Structures**

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

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

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

**Item 420: Concrete Substructures**

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

**Item 432: Riprap**

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

**Item 462: Concrete Box Culverts and Drains**
**Item 464: Reinforced Concrete Pipe**

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

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

If performing the work under the Item, "Jacking, Boring, or Tunneling Pipe or Box," use reinforced concrete pipe (except circular bell-and-spigot, arch, or horizontal elliptical pipe).

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

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

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

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

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

If groundwater is encountered while installing the storm drain system, install a suitable dewatering system to facilitate construction of the storm drains. The costs for materials and labor required to install and maintain this system are subsidiary to the Item, "Reinforced Concrete Pipe."

**Item 465: Junction Boxes, Manholes, and Inlets**

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

Construct manholes and inlets in graded areas, first to an elevation at least 4 in. above the top of the highest entering pipe and cover with a wooden cover. Complete the construction of such manholes and inlets to the finished elevation as shown on the plans when completing the grading

work for such manholes and inlets. Adjust the final elevation, if required, since this elevation is approximate.

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

Do not leave excavations or trenches open overnight.

**Items 496: Removing Structures**

Assume ownership and remove from the project site, items salvaged from the existing bridge decks and steel beams. The approximate weight of the steel beams is *XXX* tons.

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

**Item 502: Barricades, Signs, and Traffic Handling**

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

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

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

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

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

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

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

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

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

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

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

**Item 504: Field Office and Laboratory**

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

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

Adequately air condition the Type D structure and furnish it with a minimum of one desk, 3 chairs, one file cabinet, a telephone, and one built-in equipment-storage cabinet suitable for storing nuclear equipment. Ensure the cabinet is a minimum of 3 ft. wide by 2 ft. deep by 3 ft. high and has a secure lock. Provide the structure with a 240-volt electrical service entrance. Use a licensed electrician to determine the service size and service entrance conductors. Provide a minimum service of four 120-volt circuits with 20 amp breakers, and a maximum of 2 grounded convenience outlets per circuit and a minimum of two 220-volt ovens with vents to the outside. Provide a structure with a minimum of 2 convenience outlets per wall and a utility sink with an adequate, clean potable water supply for testing. Do not use space heaters to heat the structure. Use support blocks for the portable structures, tie them down, and securely attach them to the ground.

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

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

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

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

Piped-in water to the Engineer's building will not be required, but furnish water for curing concrete test specimens.

The above requirements are subsidiary to the various bid items.

Assume ownership of temporary chain link security fences.

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

A concrete cylinder test machine shall be included with the field office.

**Item 506: Temporary Erosion, Sedimentation and Environmental Controls**

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

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

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

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

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

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

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

Immediately address chemical and hydrocarbon spills caused by the Contractor. Keep a spill kit onsite.

**Item 529: Concrete Curb, Gutter, and Combined Curb and Gutter**
**Item 530: Intersections, Driveways, and Turnouts**
**Item 531: Sidewalks**

An air-entraining admixture is not required.

For concrete curbs, use Grade 7 aggregate conforming to Section 421.2.6 of the Item, "Hydraulic Cement Concrete."

For driveways and turnouts, coarse aggregate Grade No. 3 through No. 8 conforming to the gradation requirements specified in the Item, "Hydraulic Cement Concrete" will be permitted.

For reinforcing steel in sidewalks and pedestrian ramps, use No. 4 bars at a maximum 18 in. spacing center-to-center in both directions.

**Item 585: Ride Quality for Pavement Surfaces**

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

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

**Item 618: Conduit**
**Item 620: Electrical Conductors**

**County:** Harris **Control:** 0912-72-541

**Highway:** CS

**Item 628: Electrical Services**

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

**Item 618: Conduit**

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

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

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

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

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

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

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

Do not use cast iron junction boxes in concrete traffic barriers and single slope traffic barriers. Use polymer concrete junction boxes as shown on standard sheet ED(4)-14. Mount the junction boxes flush (+ 0 in., - 1/2 in.) with the concrete surface of the concrete barrier.

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

**Item 620: Electrical Conductors**

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

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

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

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

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

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

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

**Item 624: Ground Boxes**

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

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

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

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

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

**Item 628: Electrical Services**

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

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

**Item 644: Small Roadside Sign Assemblies**

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

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

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

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

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

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

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

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

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

**Item 662: Work Zone Pavement Markings**

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

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

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

**Item 662: Work Zone Pavement Markings**
**Item 666: Retroreflectorized Pavement Markings**
**Item 668: Prefabricated Pavement Markings and Rumble Strips**

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

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

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

For roadways with asphalt surfaces to be striped with work zone or permanent thermoplastic markings, the Contractor has the option to apply paint and beads markings for a maximum 30-day period until placing the thermoplastic markings, or until starting the succeeding phase of work on the striped area. Maintain the paint and beads markings, at no expense to the Department, until placing the thermoplastic markings or starting the succeeding phase of work on the striped area. The work zone markings, whether paint and beads or thermoplastic, are paid under the Item, "Work Zone Pavement Markings" and the markings are paid for only once for the given phase of construction.

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

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

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

Stripe all roadways before opening them to traffic.

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

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

**Item 672: Raised Pavement Markers**

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

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

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

**Item 677: Eliminating Existing Pavement Markings and Markers**

Remove existing pavement markings on concrete or asphalt surfaces by flail milling or as directed. Do not use flail milling on grooved concrete or porous asphalt.

**Item 678: Pavement Surface Preparation for Markings**

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

On new concrete pavement or on existing concrete pavement when placing a new stripe on a new location, remove the curing compounds and contamination from the pavement surface by flail milling or as directed. In addition, air-blast the surface with compressed air just before placing the new stripe.

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

Do not clean concrete pavement by grinding.

**Item 7004: Water Mains**

Construct water mains with Class A concrete in accordance with the Item, "Hydraulic Cement Concrete." This work is subsidiary to this bid Item.

Assume ownership of removed fire hydrants, valves, and boxes.

Cutting and plugging tees, if called for on the plans, are subsidiary to the Item, "Remove Existing Fire Hydrant."

Install only new fire hydrants, valves, and boxes conforming to the requirements of this specification. Install fire hydrants, valves, and boxes in accordance with the requirements of Section 3.13 of this specification.

Provide valves that open in a *counter*clockwise direction only.

**Item 7006: Sanitary Sewer**

Provide a record of the locations of stacks, stubs, etc. to the owner of the sanitary sewer facility.

Maintain a 12-in. minimum vertical clearance at crossings between the sanitary sewers and culverts, unless otherwise noted.

**County:** Harris **Control:** 0912-72-541

**Highway:** CS

**Basis of Estimate**

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

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

CONTROL : 0912-72-541
PROJECT : STP 2020(724)MM
HIGHWAY : CS
COUNTY : HARRIS

TEXAS DEPARTMENT OF TRANSPORTATION

**GOVERNING SPECIFICATIONS AND SPECIAL PROVISIONS**

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

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

ITEMS 1 TO 9 INCL., GENERAL REQUIREMENTS AND COVENANTS
ITEM 100 PREPARING RIGHT OF WAY <103><752>
ITEM 104 REMOVING CONCRETE
ITEM 110 EXCAVATION <132>
ITEM 132 EMBANKMENT <100><110><160><204><210><216><400>
ITEM 161 COMPOST <160>
ITEM 162 SODDING FOR EROSION CONTROL <164><166><168>
ITEM 168 VEGETATIVE WATERING
ITEM 170 IRRIGATION SYSTEM <193><402><403><618><620><624><628>
ITEM 192 LANDSCAPE PLANTING <161><166><168><734><752>
ITEM 260 LIME TREATMENT (ROAD-MIXED) <105><132><204><210><216> <247><300><310><520>
ITEM 360 CONCRETE PAVEMENT <300><421><422><431><438><440><529> <585>
ITEM 400 EXCAVATION AND BACKFILL FOR STRUCTURES <110><132><401> <402><403><416><420><421><423>
ITEM 402 TRENCH EXCAVATION PROTECTION
ITEM 420 CONCRETE SUBSTRUCTURES <400><404><421><422><426><427> <440><441><448>
ITEM 432 RIPRAP <247><420><421><431><440>
ITEM 462 CONCRETE BOX CULVERTS AND DRAINS <400><402><403><420> <421><422><424><440><464><465><467><471><476>
ITEM 464 REINFORCED CONCRETE PIPE <400><402><403><420><421><424> <440><462><465><467><471><476>
ITEM 465 JUNCTION BOXES, MANHOLES, AND INLETS <400><420><421><424> <440><462><464><471><476>
ITEM 466 HEADWALLS AND WINGWALLS <400><420><421><432><440><464>
ITEM 467 SAFETY END TREATMENT <400><420><421><432><440><442><445> <460><464>
ITEM 479 ADJUSTING MANHOLES AND INLETS <400><421><465><471>

ITEM 496 REMOVING STRUCTURES
ITEM 500 MOBILIZATION
ITEM 502 BARRICADES, SIGNS, AND TRAFFIC HANDLING <503><505><510>
ITEM 504 FIELD OFFICE AND LABORATORY
ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS <161><432><556>
ITEM 508 CONSTRUCTING DETOURS <247><292>
ITEM 529 CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER <360> <420><421><440>
ITEM 530 INTERSECTIONS, DRIVEWAYS, AND TURNOUTS <247><260><275> <276><292><316><330><334><360><421><440>
ITEM 531 SIDEWALKS <104><360><420><421><440><530>
ITEM 618 CONDUIT <400><445><476>
ITEM 624 GROUND BOXES <420><421><432><440><618><620>
ITEM 644 SMALL ROADSIDE SIGN ASSEMBLIES <421><440><441><442><445> <636><656>
ITEM 662 WORK ZONE PAVEMENT MARKINGS <666><668><672><677>
ITEM 666 RETROREFLECTORIZED PAVEMENT MARKINGS <316><502><667><677> <678>
ITEM 672 RAISED PAVEMENT MARKERS <677><678>
ITEM 677 ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS <300> <302><315><316>
ITEM 678 PAVEMENT SURFACE PREPARATION FOR MARKINGS <677>
ITEM 752 TREE AND BRUSH REMOVAL

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

REQUIRED CONTRACT PROVISIONS. ALL FEDERAL-AID PROJECTS (REV. 5-12) (FORM FHWA 1273)
WAGE RATES
SPECIAL PROVISION "NONDISCRIMINATION" (000---001)
SPECIAL PROVISION "CERTIFICATION OF NONDISCRIMINATION IN EMPLOYMENT" (000---002)
SPECIAL PROVISION "STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFIC" (000---003)
SPECIAL PROVISION "ONTHEJOB TRAINING PROGRAM" (000---004)
SPECIAL PROVISION "AMERICANS WITH DISABILITIES ACT CURB RAMP WORKSHOP " (000---006)
SPECIAL PROVISION "CARGO PREFERENCE ACT REQUIREMENTS IN FEDERAL AID CONTRA" (000---007)
SPECIAL PROVISION "NOTICE OF CONTRACTOR PERFORMANCE EVALUATIONS" (000---016)
SPECIAL PROVISION "CERTIFICATE OF INTERESTED PARTIES (FORM 1295)" (000---017)
SPECIAL PROVISION "IMPORTANT NOTICE TO CONTRACTORS" (000---018)
SPECIAL PROVISION "NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYEMENT OPPORTUNITY (EXECUTIVE O RDER 11" (000---020)
SPECIAL PROVISION "DISADVANTAGED BUSINESS ENTERPRISE IN FEDERALAID" (000---022)

SPECIAL PROVISION "IMPORTANT NOTICE TO CONTRACTORS" (000---039)
SPECIAL PROVISION TO ITEM 6 (006---001)

SPECIAL SPECIFICATIONS:
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ITEM 7004 WATER MAINS <100><400><402><403><421><440><441><465><471>
<476><479>
ITEM 7006 SANITARY SEWERS <100><400><402><403><421><440><441><465>
<471><476><479>

GENERAL: THE ABOVE-LISTED SPECIFICATION ITEMS ARE THOSE UNDER WHICH
---
PAYMENT IS TO BE MADE. THESE, TOGETHER WITH SUCH OTHER PERTINENT ITEMS, IF ANY, AS MAY BE REFERRED TO IN THE ABOVE-LISTED SPECIFICATION ITEMS, AND INCLUDING THE SPECIAL PROVISIONS LISTED ABOVE, CONSTITUTE THE COMPLETE SPECIFICATIONS FOR THIS PROJECT.

**Control** **0912-72-541**

**Project** **STP 2020(724)MM**

**Highway** **CS**

**County** **HARRIS**

## DISADVANTAGED BUSINESS ENTERPRISE REQUIREMENTS

The following goal for disadvantaged business enterprises is established:

**DBE**
**7.5%**

## Certification of DBE Goal Attainment

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

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

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

# CHILD SUPPORT STATEMENT

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

# CONFLICT OF INTEREST CERTIFICATION

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

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

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

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

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

# E-VERIFY CERTIFICATION

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

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

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

# Certification Regarding Disclosure of Public Information

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

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

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

By entering into Contract, the Contractor agrees to:

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

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

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

# CERTIFICATION TO NOT BOYCOTT ISRAEL

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

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

By signing the contract, the Contractor certifies that it does not boycott Israel and will not boycott Israel during the term of this contract. “Boycott” means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

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

# CERTIFICATION TO NOT BOYCOTT ENERGY COMPANIES

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

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

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

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

# CERTIFICATION TO NOT DISCRIMINATE AGAINST FIREARM ENTITIES OR FIREARM TRADE ASSOCIATIONS

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

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

This provision applies to a contract that:

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

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

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

# PROHIBITION ON CERTAIN TELECOMMUNICATIONS EQUIPMENT OR SERVICES

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

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

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

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

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

**REQUIRED CONTRACT PROVISIONS**
**FEDERAL-AID CONSTRUCTION CONTRACTS**

I. General
II. Nondiscrimination
III. Non-segregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
XI. Certification Regarding Use of Contract Funds for Lobbying
XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

## I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

## II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

**1. Equal Employment Opportunity:** Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (*see* 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

> "It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

**2. EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

**3. Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

**4. Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

**5. Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

**6. Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

**7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

**8. Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

**9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

**10. Assurances Required:**

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

**11. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

## III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than $10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

## IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

### 1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided,* That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH–1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is used in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to *DBAconformance@dol.gov*. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(4) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to *DBAconformance@dol.gov*, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.* Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

**2. Withholding** (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

**3. Records and certified payrolls** (29 CFR 5.5)

a. *Basic record requirements* (1) *Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements* (1) *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker ( *e.g.,* the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH–347 or in any other format desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division website at *https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347/.pdf* or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH–347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access* (1) *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

**4. Apprentices and equal employment opportunity** (29 CFR 5.5)

a. *Apprentices* (1) *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

**6. Subcontracts**. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 29 CFR 5.5.

**7. Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

**9. Disputes concerning labor standards.** As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

**10. Certification of eligibility**. a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

**11. Anti-retaliation**. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or 29 CFR part 1 or 3; or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or 29 CFR part 1 or 3.

## V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons and guards.

**1. Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

**2. Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or

mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1. of this section.

* $31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

**3. Withholding for unpaid wages and liquidated damages**

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

**4. Subcontracts.** The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

**5. Anti-retaliation.** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

## VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

**VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

**VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

**IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT** (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of $150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

**X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

* * * * *

**2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

3. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

* * * * *

**4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

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**XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

**XII. USE OF UNITED STATES-FLAG VESSELS:**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS** (23 CFR 633, Subpart B, Appendix B)
This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

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

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

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

Notes:

*Represents the USDOL wage decision.

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

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

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

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

01/05/2024

# Special Provision to Item 000
# Nondiscrimination

## 1. DESCRIPTION

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

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

## 2. DEFINITION OF TERMS

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

## 3. NONDISCRIMINATION PROVISIONS

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

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

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

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

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

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

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

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

# Special Provision to Item 000
# Certification of Nondiscrimination in Employment

## 1. GENERAL

By signing this proposal, the Bidder certifies that it has participated in a previous Contract or subcontract subject to the equal opportunity clause, as required by Executive Order (EO) 10925, 11114, or 11246, or if it has not participated in a previous Contract of this type, or if it has had previous Contracts or subcontracts and has not filed, it will file with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity (EEO), all reports due under the applicable filing requirements.

**Note**—The above certification is required by the EEO Regulations of the Secretary of Labor [41 CFR 60-1.7(b)(1)], and must be submitted by Bidders and proposed subcontractors only in connection with Contracts and subcontracts that are subject to the equal opportunity clause. Contracts and subcontracts that are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only Contracts or subcontracts of $10,000 or less are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the EOs or their implementing regulations.

Proposed prime Contractors and subcontractors that have participated in a previous Contract or subcontract subject to the EO and have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of Contracts and subcontracts unless such Contractor submits a report covering the delinquent period or such other period specified by FHWA or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

# Special Provision to Item 000

# Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246)

## 1. GENERAL

1.1. As used in these Specifications:

- "Covered area" means the geographical area described in the solicitation from which this Contract resulted;
- "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor (DOL), or any person to whom the Director delegates authority;
- "Employer identification number" means the federal Social Security number used on the employer's quarterly federal tax return, U.S. Treasury Department Form 941; and
- "Minority" includes:
  - Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
  - Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
  - Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
  - American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

1.2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it will physically include in each subcontract of more than $10,000 the provisions of these Specifications and the Notice that contains the applicable goals for minority and female participation that are set forth in the solicitations from which this Contract resulted.

1.3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by DOL in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) will be in conformance with that Plan for those trades that have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the equal employment opportunity (EEO) clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

1.4. The Contractor will implement the specific affirmative action standards provided in Sections 1.7.1.– Section 1.7.16. of this Specification. The goals set forth in the solicitation from which this Contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction Contractors performing Contracts in geographical areas where they do not have a federal or federally assisted construction Contract will apply the minority and female goals established for the geographical area where the Contract is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any OFCCP office

or any federal procurement contracting officer. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

1.5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women will excuse the Contractor's obligations under these Specifications, Executive Order (EO) 11246, or the regulations promulgated pursuant thereto.

1.6. For the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by DOL.

1.7. The Contractor will take specific affirmative actions to ensure EEO. The evaluation of the Contractor's compliance with these Specifications will be based on its effort to achieve maximum results from its actions. The Contractor will document these efforts fully and will implement affirmative action steps at least as extensive as the following.

1.7.1. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor will specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

1.7.2. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

1.7.3. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, recruitment source, or community organization, and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred to the Contractor by the union or, if referred, not employed by the Contractor, this will be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

1.7.4. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement have not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

1.7.5. Develop on-the-job training opportunities or participate in training programs for the area that expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by DOL. The Contractor will provide notice of these programs to the sources compiled under Section 1.7.2.

1.7.6. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in publications such as the company newspaper and annual report; by specifically reviewing the policy with all management personnel and with all minority and female employees at least once annually; and by posting it on bulletin boards accessible to all employees at each location where construction work is performed.

1.7.7. Review, at least annually, the company's EEO policy and affirmative action obligations under these Specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions, including specific review of these items with onsite supervisory personnel such as

superintendents and general foremen, before the initiation of construction work at any jobsite. A written record must be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

1.7.8. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.

1.7.9. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations; to schools with minority and female students; and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than 1 mo. before the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor will send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

1.7.10. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after-school, summer, and vacation employment to minority and female youth both onsite and in other areas of a Contractor's workforce.

1.7.11. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR 60-3.

1.7.12. At least annually, conduct an inventory and evaluation at least of all minority and female personnel for promotional opportunities, and encourage these employees to seek or to prepare for such opportunities through appropriate training or other means.

1.7.13. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the EEO policy and the Contractor's obligations under these Specifications are being carried out.

1.7.14. Ensure that all facilities and company activities are non-segregated, except that separate or single-user toilet and necessary changing facilities will be provided to assure privacy between the sexes.

1.7.15. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

1.7.16. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

1.8. Contractors are encouraged to participate in voluntary associations that assist in fulfilling one or more of their affirmative action obligations (Sections 1.7.1.–1.7.16. of this Specifications). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant may be asserted as fulfilling any one or more of its obligations under Sections 1.7.1–1.7.16. of this Specification, provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's, and failure of such a group to fulfill an obligation will not be a defense for the Contractor's noncompliance.

1.9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide EEO and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the EO if a particular group is employed in a substantially disparate manner (e.g., even though the Contractor

has achieved its goals for women generally, the Contractor may be in violation of the EO if a specific minority group of women is underused).

1.10. The Contractor must not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

1.11. The Contractor will not enter into any subcontract with any person or firm debarred from Government Contracts pursuant to EO 11246.

1.12. The Contractor will carry out such sanctions and penalties for violation of these Specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to EO 11246, as amended, and its implementing regulations, by OFCCP. Any Contractor who fails to carry out such sanctions and penalties will be in violation of these Specifications and EO 11246, as amended.

1.13. The Contractor, in fulfilling its obligations under these Specifications, will implement specific affirmative action steps, at least as extensive as those standards prescribed in Section 1.7 of this Specification, to achieve maximum results from its efforts to ensure EEO. If the Contractor fails to comply with the requirements of the EO, the implementing regulations, or these Specifications, the Director will proceed in accordance with 41 CFR 60-4.8.

1.14. The Contractor will designate a responsible official to monitor all employment-related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records must at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, Social Security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records must be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors will not be required to maintain separate records.

1.15. Nothing herein provided will be construed as a limitation on the application of other laws that establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

1.16. In addition to the reporting requirements set forth elsewhere in this Contract, the Contractor and the subcontractors holding subcontracts, not including material suppliers, of $10,000 or more, will submit for every month of July during which work is performed, employment data as contained under Form PR 1391 (Appendix C to 23 CFR 230), and in conformance with the included instructions.

# Special Provision to Item 000
# On-the-Job Training Program

## 1. DESCRIPTION

The primary objective of this Special Provision is the training and advancement of minorities, women, and economically disadvantaged persons toward journeyworker status. Accordingly, make every effort to enroll minority, women, and economically disadvantaged persons to the extent that such persons are available within a reasonable area of recruitment. This training commitment is not intended to, and will not be used to, discriminate against any applicant for training, whether he or she is a member of a minority group or not.

## 2. TRAINEE ASSIGNMENT

Training assignments are based on the past volume of State-let highway construction Contracts awarded with the Department. Contractors meeting the selection criteria will be notified of their training assignment at the beginning of the reporting year by the Department's Civil Rights Division.

## 3. PROGRAM REQUIREMENTS

Fulfill all the requirements of the On-the-Job Training Program, including the maintenance of records and submittal of periodic reports documenting program performance. Trainees will be paid at least 60% of the appropriate minimum journeyworker's rate specified in the Contract for the first half of the training period, 75% for the third quarter, and 90% for the last quarter, respectively.

## 4. REIMBURSEMENT

If requested, Contractors may be reimbursed $0.80 per training hour at no additional cost to the Department. Training may occur on this project, all other Department Contracts, or locally administered federal aid projects with concurrence of the local government entity. However, reimbursement for training is not available on projects to the extent that such projects do not contain federal funds.

## 5. COMPLIANCE

The Contractor will have fulfilled the contractual responsibilities by having provided acceptable training to the number of trainees specified in their goal assignment. Noncompliance may be cause for corrective and appropriate measures in accordance with Article 8.7., "Default of Contract," which may be used to comply with the sanctions for noncompliance pursuant to 23 CFR 230.

# Special Provision to Item 000
# Americans with Disabilities Act Curb Ramp Workshop

Before starting work, schedule and attend a mandatory preconstruction Americans with Disabilities Act curb ramp workshop. The workshop will be administered by the Department, will be 4 hr. or less, and will be held during normal working hours at an approved location near the project.

Supervisory personnel responsible for control of the work must attend the workshop.

The Department will provide workshop facilitators and facilities. No direct compensation will be made for fulfilling these requirements because this workshop will be subsidiary to the Items of the Contract.

# Special Provision 000

# Cargo Preference Act Requirements in Federal Aid Contracts

## 1. DESCRIPTION

All recipients of federal financial assistance are required to comply with the U.S. Department of Transportation's Cargo Preference Act requirements, 46 CFR 381, "Use of United States-Flag Vessels."

This requirement applies to material or equipment that is acquired specifically for a federal-aid highway project. It is not applicable to goods or materials that come into inventories independent of an FHWA-funded Contract.

When oceanic shipments are necessary for materials or equipment acquired for a specific federal-aid construction project, the Contractor agrees to:

- use privately owned United States-flag commercial vessels to ship at least 50% of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this Contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels;

- furnish a legible copy of a rated, onboard commercial ocean bill of lading in English for each shipment of cargo described in Paragraph (b)(1) of 46 CFR 381, Section 7, "Federal Grant, Guaranty, Loan and Advance of Funds Agreements," within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, to both the Engineer (through the prime Contractor in the case of subcontractor bills of lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590; and

- insert the substance of the provisions of this clause in all subcontracts issued pursuant to this Contract.

# Special Provision 000
# Important Notice to Contractors

## 1. GENERAL

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

## 2. DEFINISIONS

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

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

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

## 3. CONTRACTOR EVALUATIONS

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

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

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

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

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

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

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

## 4. DIVISION OVERSIGHT

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

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

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

## 5. PERFORMANCE REVIEW COMMITTEE

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

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

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

## 6. APPEALS PROCESS

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

# Special Provision 000
# Certificate of Interested Parties (Form 1295)

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

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

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

# Special Provision 000
# Important Notice to Contractors

**Table 1**
**Daily Contract Administration Liquidated Damages**

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

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

# Special Provision to Item 000

# Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)

## 1. GENERAL

In addition to the affirmative action requirements of the Special Provision titled "Standard Federal Equal Employment Opportunity Construction Contract Specifications" as set forth elsewhere in this proposal, the Bidder's attention is directed to the specific requirements for use of minorities and females as set forth below.

## 2. GOALS

Goals for minority and female participation are hereby established in accordance with 41 CFR 60-4.

The goals for minority and female participation expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area are as follows:

| Goals for Minority Participation in Each Trade (%) | Goals for Female Participation in Each Trade (%) |
|---|---|
| See Table 1 | 6.9 |

These goals are applicable to all the Contractor's construction work (whether it is federal or federally assisted or not) performed in the covered area. If the Contractor performs construction work in a geographical area located outside the covered area, it will apply the goals established for such geographical area where the work is actually performed. Regarding this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction. The Contractor's compliance with the Executive Order (EO) and the regulations in 41 CFR 60-4 will be based on its implementation of the Standard Federal Equal Employment Opportunity Construction Contract Specifications Special Provision and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and the Contractor must make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority and female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals will be a violation of the Contract, the EO, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

The overall good performance of other Contractors and subcontractors toward a goal in an approved plan does not excuse any covered Contractor's or subcontractor's failure to make good faith efforts to achieve the goals contained in these provisions. Contractors or subcontractors participating in the plan must be able to demonstrate their participation and document their compliance with the provisions of this plan.

## 3. SUBCONTRACTING

The Contractor must provide written notification to the Department within 10 working days of award of any construction subcontract more than $10,000 at any tier for construction work under the Contract resulting from this solicitation pending concurrence of the Department in the award. The notification will list the names, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and geographical area in which the Contract is to be performed.

## 4. COVERED AREA

As used in this Special Provision, and in the Contract resulting from this solicitation, the geographical area covered by these goals for female participation is the State of Texas. The geographical area covered by these goals for other minorities comprises the counties in the State of Texas as indicated in Table 1.

## 5. REPORTS

The Contractor is hereby notified that he may be subject to the Office of Federal Contract Compliance Programs (OFCCP) reporting and recordkeeping requirements as provided for under EO 11246 as amended. OFCCP will provide direct notice to the Contractor as to the specific reporting requirements that it will be expected to fulfill.

**Table 1**
**Goals for Minority Participation**

| County | Participation, % | County | Participation, % |
|---|---|---|---|
| Anderson | 22.5 | Chambers | 27.4 |
| Andrews | 18.9 | Cherokee | 22.5 |
| Angelina | 22.5 | Childress | 11.0 |
| Aransas | 44.2 | Clay | 12.4 |
| Archer | 11.0 | Cochran | 19.5 |
| Armstrong | 11.0 | Coke | 20.0 |
| Atascosa | 49.4 | Coleman | 10.9 |
| Austin | 27.4 | Collin | 18.2 |
| Bailey | 19.5 | Collingsworth | 11.0 |
| Bandera | 49.4 | Colorado | 27.4 |
| Bastrop | 24.2 | Comal | 47.8 |
| Baylor | 11.0 | Comanche | 10.9 |
| Bee | 44.2 | Concho | 20.0 |
| Bell | 16.4 | Cooke | 17.2 |
| Bexar | 47.8 | Coryell | 16.4 |
| Blanco | 24.2 | Cottle | 11.0 |
| Borden | 19.5 | Crane | 18.9 |
| Bosque | 18.6 | Crockett | 20.0 |
| Bowie | 19.7 | Crosby | 19.5 |
| Brazoria | 27.3 | Culberson | 49.0 |
| Brazos | 23.7 | Dallam | 11.0 |
| Brewster | 49.0 | Dallas | 18.2 |
| Briscoe | 11.0 | Dawson | 19.5 |
| Brooks | 44.2 | Deaf Smith | 11.0 |
| Brown | 10.9 | Delta | 17.2 |
| Burleson | 27.4 | Denton | 18.2 |
| Burnet | 24.2 | DeWitt | 27.4 |
| Caldwell | 24.2 | Dickens | 19.5 |
| Calhoun | 27.4 | Dimmit | 49.4 |
| Callahan | 11.6 | Donley | 11.0 |
| Cameron | 71.0 | Duval | 44.2 |
| Camp | 20.2 | Eastland | 10.9 |
| Carson | 11.0 | Ector | 15.1 |
| Cass | 20.2 | Edwards | 49.4 |
| Castro | 11.0 | Ellis | 18.2 |

| County | Participation, % | County | Participation, % |
|---|---|---|---|
| El Paso | 57.8 | Kenedy | 44.2 |
| Erath | 17.2 | Kent | 10.9 |
| Falls | 18.6 | Kerr | 49.4 |
| Fannin | 17.2 | Kimble | 20.0 |
| Fayette | 27.4 | King | 19.5 |
| Fisher | 10.9 | Kinney | 49.4 |
| Floyd | 19.5 | Kleberg | 44.2 |
| Foard | 11.0 | Knox | 10.9 |
| Fort Bend | 27.3 | Lamar | 20.2 |
| Franklin | 17.2 | Lamb | 19.5 |
| Freestone | 18.6 | Lampasas | 18.6 |
| Frio | 49.4 | LaSalle | 49.4 |
| Gaines | 19.5 | Lavaca | 27.4 |
| Galveston | 28.9 | Lee | 24.2 |
| Garza | 19.5 | Leon | 27.4 |
| Gillespie | 49.4 | Liberty | 27.3 |
| Glasscock | 18.9 | Limestone | 18.6 |
| Goliad | 27.4 | Lipscomb | 11.0 |
| Gonzales | 49.4 | Live Oak | 44.2 |
| Gray | 11.0 | Llano | 24.2 |
| Grayson | 9.4 | Loving | 18.9 |
| Gregg | 22.8 | Lubbock | 19.6 |
| Grimes | 27.4 | Lynn | 19.5 |
| Guadalupe | 47.8 | Madison | 27.4 |
| Hale | 19.5 | Marion | 22.5 |
| Hall | 11.0 | Martin | 18.9 |
| Hamilton | 18.6 | Mason | 20.0 |
| Hansford | 11.0 | Matagorda | 27.4 |
| Hardeman | 11.0 | Maverick | 49.4 |
| Hardin | 22.6 | McCulloch | 20.0 |
| Harris | 27.3 | McLennan | 20.7 |
| Harrison | 22.8 | McMullen | 49.4 |
| Hartley | 11.0 | Medina | 49.4 |
| Haskell | 10.9 | Menard | 20.0 |
| Hays | 24.1 | Midland | 19.1 |
| Hemphill | 11.0 | Milam | 18.6 |
| Henderson | 22.5 | Mills | 18.6 |
| Hidalgo | 72.8 | Mitchell | 10.9 |
| Hill | 18.6 | Montague | 17.2 |
| Hockley | 19.5 | Montgomery | 27.3 |
| Hood | 18.2 | Moore | 11.0 |
| Hopkins | 17.2 | Morris | 20.2 |
| Houston | 22.5 | Motley | 19.5 |
| Howard | 18.9 | Nacogdoches | 22.5 |
| Hudspeth | 49.0 | Navarro | 17.2 |
| Hunt | 17.2 | Newton | 22.6 |
| Hutchinson | 11.0 | Nolan | 10.9 |
| Irion | 20.0 | Nueces | 41.7 |
| Jack | 17.2 | Ochiltree | 11.0 |
| Jackson | 27.4 | Oldham | 11.0 |
| Jasper | 22.6 | Orange | 22.6 |
| Jeff Davis | 49.0 | Palo Pinto | 17.2 |
| Jefferson | 22.6 | Panola | 22.5 |
| Jim Hogg | 49.4 | Parker | 18.2 |
| Jim Wells | 44.2 | Parmer | 11.0 |
| Johnson | 18.2 | Pecos | 18.9 |
| Jones | 11.6 | Polk | 27.4 |
| Karnes | 49.4 | Potter | 9.3 |
| Kaufman | 18.2 | Presidio | 49.0 |
| Kendall | 49.4 | Randall | 9.3 |

| County | Participation, % | County | Participation, % |
|---|---|---|---|
| Rains | 17.2 | Reagan | 20.0 |
| Real | 49.4 | Throckmorton | 10.9 |
| Red River | 20.2 | Titus | 20.2 |
| Reeves | 18.9 | Tom Green | 19.2 |
| Refugio | 44.2 | Travis | 24.1 |
| Roberts | 11.0 | Trinity | 27.4 |
| Robertson | 27.4 | Tyler | 22.6 |
| Rockwall | 18.2 | Upshur | 22.5 |
| Runnels | 20.0 | Upton | 18.9 |
| Rusk | 22.5 | Uvalde | 49.4 |
| Sabine | 22.6 | Val Verde | 49.4 |
| San Augustine | 22.5 | Van Zandt | 17.2 |
| San Jacinto | 27.4 | Victoria | 27.4 |
| San Patricio | 41.7 | Walker | 27.4 |
| San Saba | 20.0 | Waller | 27.3 |
| Schleicher | 20.0 | Ward | 18.9 |
| Scurry | 10.9 | Washington | 27.4 |
| Shackelford | 10.9 | Webb | 87.3 |
| Shelby | 22.5 | Wharton | 27.4 |
| Sherman | 11.0 | Wheeler | 11.0 |
| Smith | 23.5 | Wichita | 12.4 |
| Somervell | 17.2 | Wilbarger | 11.0 |
| Starr | 72.9 | Willacy | 72.9 |
| Stephens | 10.9 | Williamson | 24.1 |
| Sterling | 20.0 | Wilson | 49.4 |
| Stonewall | 10.9 | Winkler | 18.9 |
| Sutton | 20.0 | Wise | 18.2 |
| Swisher | 11.0 | Wood | 22.5 |
| Tarrant | 18.2 | Yoakum | 19.5 |
| Taylor | 11.6 | Young | 11.0 |
| Terrell | 20.0 | Zapata | 49.4 |
| Terry | 19.5 | Zavala | 49.4 |

# Special Provision to Item 000
# Disadvantaged Business Enterprise in Federal-Aid Contracts

## 1. DESCRIPTION

The purpose of this Special Provision is to carry out the U.S. Department of Transportation's (DOT) policy of ensuring nondiscrimination in the award and administration of DOT-assisted Contracts and creating a level playing field on which firms owned and controlled by individuals who are determined to be socially and economically disadvantaged can compete fairly for DOT-assisted Contracts.

## 2. DISADVANTAGED BUSINESS ENTERPRISE IN FEDERAL-AID CONTRACTS

2.1. **Policy.** It is the policy of the DOT and the Texas Department of Transportation (Department) that DBEs, as defined in 49 CFR Part 26, Subpart A, and the Department's DBE Program, will have the opportunity to participate in the performance of Contracts financed in whole or in part with federal funds. The DBE requirements of 49 CFR Part 26, and the Department's DBE Program, apply to this Contract as follows.

The Contractor must solicit DBEs through reasonable and available means, as defined in 49 CFR Part 26, Appendix A, and the Department's DBE Program, or show a good faith effort to meet the DBE goal for this Contract.

The Contractor, subrecipient, or subcontractor will not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. Carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted Contracts. Failure to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the Department deems appropriate.

The requirements of this Special Provision must be physically included in any subcontract.

By signing the Contract proposal, the Bidder is certifying that the DBE goal as stated in the proposal will be met by obtaining commitments from eligible DBEs or that the Bidder will provide acceptable evidence of good faith effort to meet the commitment.

2.2. **Definitions.**

2.2.1. **Administrative Reconsideration.** A process by which the low bidder may request reconsideration when the Department determines the good faith effort (GFE) requirements have not been met.

2.2.2. **Commercially Useful Function (CUF).** A CUF occurs when a DBE has the responsibility for the execution of the work and carrying out such responsibilities by actually performing, managing, and supervising the work.

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

2.2.4. **DBE Joint Venture.** An association of a DBE firm and one or more other firms to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills, and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the Contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

2.2.5. **DOT.** The U.S. Department of Transportation, including the Office of the Secretary, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Federal Aviation Administration (FAA).

2.2.6. **Federal-Aid Contract.** Any Contract between the Department and a Contractor that is paid for in whole or in part with DOT financial assistance.

2.2.7. **Good Faith Effort.** All necessary and reasonable steps to achieve the contract goal which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain enough DBE participation, even if not fully successful. Good faith efforts are evaluated before award and throughout performance of the Contract. For guidance on good faith efforts, see 49 CFR Part 26, Appendix A.

2.2.8. **North American Industry Classification System (NAICS).** A designation that best describes the primary business of a firm. The NAICS is described in the North American Industry Classification Manual—United States, which is available on the Internet at the U.S. Census Bureau website: http://www.census.gov/eos/www/naics/.

2.2.9. **Race-Conscious.** A measure or program that is focused specifically on assisting only DBEs, including women-owned businesses.

2.2.10. **Race-Neutral DBE Participation.** Any participation by a DBE through customary competitive procurement procedures.

2.2.11. **Texas Unified Certification Program (TUCP) Directory.** An online directory listing all DBEs currently certified by the TUCP. The Directory identifies DBE firms whose participation on a Contract may be counted toward achievement of the assigned DBE Contract goal.

2.3. **Contractor's Responsibilities.**

2.3.1. **DBE Liaison Officer**. Designate a DBE liaison officer who will administer the Contractor's DBE program and who will be responsible for maintenance of records of efforts and contacts made to subcontract with DBEs.

2.3.2. **Compliance Tracking System (CTS)**. This Contract is subject to electronic Contract compliance tracking. Contractors and DBEs are required to provide any noted and requested Contract compliance-related data electronically in the Department's tracking system. This includes commitments, payments, substitutions, and good faith efforts. Contractors and DBEs are responsible for responding by any noted response date or due date to any instructions or request for information, and to check the system on a regular basis. A Contractor is responsible for ensuring all DBEs have completed all requested items and that their contact information is accurate and up-to-date. The Department may require additional information related to the Contract to be provided electronically through the system at any time before, during, or after contract award. The system is web-based and can be accessed at the following Internet address: https://txdot.txdotcms.com/.

In its sole discretion, the Department may require that contract compliance tracking data be submitted by Contractors and DBEs in an alternative format prescribed by the Department.

2.3.3. **Apparent Low Bidder.** The apparent low bidder must submit DBE commitments to satisfy the DBE goal or submit good faith effort Form 2603 and supporting documentation demonstrating why the goal could not be achieved, in whole or part, no later than 5 calendar days after bid opening. The means of transmittal and the

risk of timely receipt of the information will be the bidder's responsibility and no extension of the 5-calendar-day timeframe will be allowed for any reason.

2.3.4. **DBE Contractor.** A DBE Contractor may receive credit toward the DBE goal for work performed by its own forces and work subcontracted to DBEs. If a DBE subcontracts to a non-DBE, that information must be reported monthly.

2.3.5. **DBE Committal.** Only those DBEs certified by the TUCP are eligible to be used for goal attainment. The Department maintains the TUCP DBE Directory. The Directory can be accessed at the following Internet address: https://txdot.txdotcms.com/FrontEnd/VendorSearchPublic.asp?TN=txdot&XID=2340.

A DBE must be certified on the day the commitment is considered and at time of subcontract execution. It is the Contractor's responsibility to ensure firms identified for participation are approved certified DBE firms.

The Bidder is responsible to ensure that all submittals are checked for accuracy. Any and all omissions, deletions, and/or errors that may affect the end result of the commitment package are the sole liabilities of the bidder.

Commitments in excess of the goal are considered race-neutral commitments.

2.3.6. **Good Faith Effort Requirements.** A Contractor who cannot meet the Contract goal, in whole or in part, must make adequate good faith efforts to obtain DBE participation as so stated and defined in 49 CFR Part 26, Appendix A.

2.3.6.1. **Administrative Reconsideration.** If the Department determines that the apparent low bidder has failed to satisfy the good faith efforts requirement, the Department will notify the Bidder of the failure and will give the Bidder an opportunity to provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so..

The Bidder must request an administrative reconsideration of that determination within 3 days of the date of receipt of the notice. The request must be submitted directly to the Texas Department of Transportation, Civil Rights Division, 125 East 11th Street, Austin, Texas 78701-2483.

If a request for administrative reconsideration is not filed within the period specified the determination made is final and further administrative appeal is barred.

If a reconsideration request is timely received, the reconsideration decision will be made by the Department's DBE liaison officer or, if the DBE liaison officer took part in the original determination, the Department's executive director will appoint a department employee to perform the administrative reconsideration. The employee will hold a senior leadership position and will report directly to the executive director.

The meeting or written documentation must be provided or held within 7 days of the date the request was submitted.

The Department will provide to the Bidder a written decision if the Bidder did or did not make adequate good faith efforts to meet the Contract goal. The reconsideration decision is final and is not administratively appealed to DOT.

2.3.7. **Determination of DBE Participation.** The work performed by the DBE must be reasonably construed to be included in the work area and NAICS work code identified by the Contractor in the approved commitment.

Participation by a DBE on a Contract will not be counted toward DBE goals until the amount of the participation has been paid to the DBE.

Payments made to a DBE that was not on the original commitment may be counted toward the Contract goal if that DBE was certified as a DBE before the execution of the subcontract and has performed a Commercially Useful Function.

The total amount paid to the DBE for work performed with its own forces is counted toward the DBE goal. When a DBE subcontracts part of the work of its Contract to another firm, the value of the subcontracted work may be counted toward DBE goals only if the subcontractor is itself a DBE.

DBE Goal credit for the DBE subcontractors leasing of equipment or purchasing of supplies from the Contractor or its affiliates is not allowed. Project materials or supplies acquired from an affiliate of the Contractor cannot directly or indirectly (second or lower tier subcontractor) be used for DBE goal credit.

If a DBE firm is declared ineligible due to DBE decertification after the execution of the DBE's subcontract, the DBE firm may complete the work and the DBE firm's participation will be counted toward the Contract goal. If the DBE firm is decertified before the DBE firm has signed a subcontract, the Contractor is obligated to replace the ineligible DBE firm or demonstrate that it has made good faith efforts to do so.

The Contractor may count 100% of its expenditure to a DBE manufacturer. According to 49 CFR 26.55(e)(1)(i), a DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the Contract and of the general character described by the specifications.

The Contractor may count only 60% of its expenditure to a DBE regular dealer. According to 49 CFR 26.55(e)(2)(i), a DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles, or equipment of the general character described by the specifications and required under the Contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. A firm may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business if the firm both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment must be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis. A long-term lease with a third-party transportation company is not eligible for 60% goal credit.

With respect to materials or supplies purchased from a DBE that is neither a manufacturer nor a regular dealer, the Contractor may count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a jobsite.

A Contractor may count toward its DBE goal a portion of the total value of the Contract amount paid to a DBE joint venture equal to the distinct, clearly defined portion of the work of the Contract performed by the DBE.

2.3.8. **Commercially Useful Function.** It is the Contractor's obligation to ensure that each DBE used on federal-assisted contracts performs a commercially useful function on the Contract.

The Department will monitor performance during the Contract to ensure each DBE is performing a CUF.

Under the terms established in 49 CFR 26.55, a DBE performs a CUF when it is responsible for execution of the work of the Contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved.

With respect to material and supplies used on the Contract, a DBE must be responsible for negotiating price, determining quality and quantity, ordering the material, installing the material, if applicable, and paying for the material itself.

With respect to trucking, the DBE trucking firm must own and operate at least one fully licensed, insured, and operational truck used on the Contract. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Contract. The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE that leases trucks equipped with drivers from a non-DBE is entitled to credit for the total value of transportation services provided by non-DBE leased trucks equipped with drivers not to exceed the value of transportation services on the Contract provided by DBE-owned trucks or leased trucks with DBE employee drivers. Additional participation by non-DBE owned trucks equipped with drivers receives credit only for the fee or commission it receives as a result of the lease arrangement.

A DBE does not perform a CUF when its role is limited to that of an extra participant in a transaction, Contract, or project through which funds are passed to obtain the appearance of DBE participation. The Department will evaluate similar transactions involving non-DBEs to determine whether a DBE is an extra participant.

If a DBE does not perform or exercise responsibility for at least 30% of the total cost of its Contract with its own work force, or the DBE subcontracts a greater portion of the work than would be expected on the basis of normal industry practice for the type of work involved, the Department will presume that the DBE is not performing a CUF.

If the Department determines that a DBE is not performing a CUF, no work performed by such DBE will count as eligible participation. The denial period of time may occur before or after a determination has been made by the Department.

In case of the denial of credit for non-performance of a CUF, the Contractor will be required to provide a substitute DBE to meet the Contract goal or provide an adequate good faith effort when applicable.

2.3.8.1. **Rebuttal of a Finding of No Commercially Useful Function.** Consistent with the provisions of 49 CFR 26.55(c)(4)&(5), before the Department makes a final finding that no CUF has been performed by a DBE, the Department will notify the DBE and provide the DBE the opportunity to provide rebuttal information.

CUF determinations are not subject to administrative appeal to DOT.

2.3.9. **Joint Check.** The use of joint checks between a Contractor and a DBE is allowed with Department approval. To obtain approval, the Contractor must submit a completed Form 2178, “DBE Joint Check Approval,” to the Department.

The Department will closely monitor the use of joint checks to ensure that such a practice does not erode the independence of the DBE nor inhibit the DBE’s ability to perform a CUF. When joint checks are used, DBE credit toward the Contract goal will be allowed only when the subcontractor is performing a CUF in accordance with 49 CFR 26.55(c)(1).

Long-term or open-ended joint checking arrangements may be a basis for further scrutiny and may result in the lack of participation towards the Contract goal requirement if DBE independence cannot be established.

Joint checks will not be allowed simply for the convenience of the Contractor.

If the proper procedures are not followed or the Department determines that the arrangements result in a lack of independence for the DBE involved, no credit for the DBE’s participation as it relates to the material cost will be used toward the Contract goal requirement, and the Contractor will need to make up the difference elsewhere on the project.

2.3.10. **DBE Termination and Substitution.** No DBE named in the commitment submitted under Section 2.3.5. will be terminated for convenience, in whole or part, without the Department’s approval. This includes, but is not

limited to, instances in which a Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

Unless consent is provided, the Contractor will not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

The Contractor, before submitting its request to terminate, must first give written notice to the DBE of its intent to terminate and the reason for the termination. The Contractor will copy the Department on the Notice of Intent to terminate.

The DBE has 5 calendar days to respond to the Contractor's notice and will advise the Contractor and the Department of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Department should not approve the prime Contractor's request for termination.

The Department may provide a shorter response time if required in a particular case as a matter of public necessity.

The Department will consider both the Contractor's request and DBE's stated position before approving the request. The Department may provide a written approval only if it agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate the DBE. If the Department does not approve the request, the Contractor must continue to use the committed DBE firm in accordance with the Contract. For guidance on what good cause includes, see 49 CFR 26.53.

Good cause does not exist if the Contractor seeks to terminate, reduce, or substitute a DBE it relied upon to obtain the Contract so that the Contractor can self-perform the work for which the DBE firm was engaged.

When a DBE subcontractor is terminated, make good faith efforts to find, as a substitute for the original DBE, another DBE to perform, at least to the extent needed to meet the established Contract goal, the work that the original DBE was to have performed under the Contract.

Submit the completed Form 2228, "DBE Termination Substitution Request," within seven (7) days, which may be extended for an additional 7 days if necessary at the request of the Contractor. The Department will provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated. If the Department determines that good faith efforts were not demonstrated, the Contractor will have the opportunity to appeal the determination to the Civil Rights Division.

2.3.11. **Reports and Records.** By the 15th of each month and after work begins, report payments to meet the DBE goal and for DBE race-neutral participation on projects with or without goals. These payment reports will be required until all DBE subcontracting or material supply activity is completed. Negative payment reports are required when no activity has occurred in a monthly period.

Notify the Area Engineer if payment to any DBE subcontractor is withheld or reduced.

Before receiving final payment from the Department, the Contractor must indicate a final payment on the compliance tracking system. The final payment is a summary of all payments made to the DBEs on the project.

All records must be retained for a period of 3 years following completion of the Contract work, and must be available at reasonable times and places for inspection by authorized representatives of the Department or the DOT. Provide copies of subcontracts or agreements and other documentation upon request.

2.3.12. **Failure to Comply.** If the Department determines the Contractor has failed to demonstrate good faith efforts to meet the assigned goal, the Contractor will be given an opportunity for reconsideration by the Department.

A Contractor's failure to comply with the requirements of this Special Provision will constitute a material breach of this Contract. In such a case, the Department reserves the right to terminate the Contract; to deduct the amount of DBE goal not accomplished by DBEs from the money due or to become due the Contractor; or to secure a refund, not as a penalty but as liquidated damages, to the Department or such other remedy or remedies as the Department deems appropriate.

2.3.13. **Investigations.** The Department may conduct reviews or investigations of participants as necessary. All participants, including, but not limited to, DBEs and complainants using DBE Subcontractors to meet the Contract goal, are required to cooperate fully and promptly with compliance reviews, investigations, and other requests for information.

2.3.14. **Falsification and Misrepresentation.** If the Department determines that a Contractor or subcontractor was a knowing and willing participant in any intended or actual subcontracting arrangement contrived to artificially inflate DBE participation or any other business arrangement determined by the Department to be unallowable, or if the Contractor engages in repeated violations, falsification, or misrepresentation, the Department may:

- refuse to count any fraudulent or misrepresented DBE participation;
- withhold progress payments to the Contractor commensurate with the violation;
- reduce the Contractor's prequalification status;
- refer the matter to the Office of Inspector General of the US Department of Transportation for investigation; and/or
- seek any other available contractual remedy.

# Special Provision 000
# Important Notice to Contractors

As of August 28, 2024, utilities and right of way within the project limits have not been cleared. The Department anticipates clearance by the dates listed below. Unless otherwise stated, clearance of these obstructions will be performed by their owners. Estimated clearance dates are not anticipated to interfere with the Contractor's operations. In the event the clearance dates are not met, requests for additional compensation or time will be made in accordance with the standard specifications.

The Contractor is invited to review the mapped information of obstructions on file with the Engineer.

| UTILITIES | | | | | | |
|---|---|---|---|---|---|---|
| **Owner** | **Alignment** | **Station** | **Offset** | **Description** | **Estimated Adjustment Date** | **Effects on Construction** |
| Phonoscope | NASA 1 Bypass/ W NASA Blvd | 104+10/ 52+75 | 47.5' LT/ 40.5' RT | Communications | November 18, 2024 | None if adjusted by date shown. |
| CenterPoint Gas | NASA 1 Bypass/ W NASA Blvd | 103+82/ 52+40 | 45.7' LT/ 40.5' RT | Gas | November 18, 2024 | None if adjusted by date shown. |

| RIGHT-OF-WAY | | | |
|---|---|---|---|
| **Parcel No.** | **Owner** | **Estimated Date of Acquisition** | **Effects on Construction** |
| 2E | Watcent, Inc. | November 1, 2024 | None if acquired by date shown. |
| 3 | Sonoma Corporation | November 1, 2024 | None if acquired by date shown. |
| 4E | Sonoma Corporation | November 1, 2024 | None if acquired by date shown. |

# Special Provision to Item 6
# Control of Materials

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

**Section 1.1. "Buy America," and Section 1.2., "Buy America Exceptions,"** are voided and replaced by the following.

1.1. **Buy America**. Comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law and applicable CFR, which restrict funds being made available from Federal financial assistance programs unless all the iron products, steel products, manufactured products, and construction materials used in the project are produced in the United States. Use iron or steel products, manufactured products, or construction materials produced in the United States for all permanently installed materials and products except when defined in Section 1.1.5., "Buy America Exceptions."

A material is solely classified based on its status at the time it is brought to the work site as either an iron or steel product, construction material, manufactured product, or Section 70917(c) material. Refer to the Buy America Material Classification Sheet found in the general notes or txdot.gov for additional clarification on material classification.

1.1.1. **Iron or Steel**. Iron or steel products means articles, materials, or supplies that consist of iron or steel or a combination of both. For iron or steel products, manufacturing includes any process that modifies the chemical content, physical shape or size, or final finish of a product. The manufacturing process begins with initial melting and mixing and continues through fabrication (e.g., cutting, drilling, welding, bending.) and coating (e.g., paint, galvanizing, epoxy).

For iron or steel products, submit a notarized original FORM D-9-USA-1 (Department Form 1818) with the proper attachments for verification of compliance.

1.1.2. **Section 70917(c) Materials**. Section 70917(c) materials mean cement and cementitious material; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives. Section 70917(c) materials do not require domestic sourcing or Buy America certification.

1.1.3. **Construction Materials**. Construction materials are classified as articles, materials, or supplies that consist of only one of the items listed in bullets below. Minor additions (as determined by the plans or the Engineer) to any of the items listed is still a construction material.

- non-ferrous metals,
- plastic and polymer-based products (including polyvinyl chloride, composite building materials, and polymers used in fiber optic cables),
- glass (including optic glass),
- fiber optic cable (including drop cable),
- optical fiber,
- lumber,
- engineered wood, or
- drywall.

For construction materials, submit a Construction Material Buy America Certification Form (Department Form 2806) for verification of compliance that all manufacturing processes, as required, occurred in the

United States. Each construction material has specific certification requirements stated below. Provide additional documentation as requested.

Details shown on the plans provide additional clarification on Buy America requirements.

For non-ferrous metals, certification requires all manufacturing processes, from initial smelting or melting through final shaping, coating, and assembly, occurred in the United States.

For plastic and polymer-based products (including polyvinyl chloride, composite building materials, and polymers used in fiber optic cables), certification requires all manufacturing processes, from initial combination of constituent plastic or polymer-based inputs, or, where applicable, constituent composite materials, until the item is in its final form, occurred in the United States.

For glass (including optic glass), certification requires all manufacturing processes, from initial batching and melting of raw materials through annealing, cooling, and cutting, occurred in the United States.

For fiber optic cable (including drop cable), certification requires all manufacturing processes, from the initial ribboning (if applicable), through buffering, fiber stranding and jacketing, occurred in the United States. All manufacturing processes also include the standards for glass and optical fiber, but not for non-ferrous metals, plastic and polymer-based products, or any others.

For optical fiber, certification requires all manufacturing processes, from the initial preform fabrication stage through the completion of the draw, occurred in the United States.

For lumber, certification requires all manufacturing processes, from initial debarking through treatment and planing, occurred in the United States.

For engineered wood, certification requires all manufacturing processes from the initial combination of constituent materials until the wood product is in its final form, occurred in the United States.

For drywall, certification requires all manufacturing processes, from initial blending of mined or synthetic gypsum plaster and additives through cutting and drying of sandwiched panels, occurred in the United States.

1.1.4. **Manufactured Products**. Materials classified as a manufactured product are currently waived from Buy America requirements by an FHWA general waiver and are not required to be domestically sourced. However, iron or steel products incorporated into manufactured products must meet iron and steel compliance requirements.

1.1.5. **Buy America Exceptions**. Use of iron, steel, construction materials, and manufactured products manufactured in the United States is required unless the material meets an exception below.

- A waiver exists exempting the material from Buy America compliance.
- The total value of the non-compliant products (other than iron or steel products) is no more than the lesser of $1,000,000 or 5% of Total Applicable Costs for the project. Total Applicable Cost means the actual cost of all materials requiring Buy America compliance including iron, steel, or other materials that are within the scope of existing waivers. Contractor must provide documentation showing under threshold in advance for Engineer's consideration.
- The total value of foreign iron and steel products, including delivery, does not exceed 0.1% of the total Contract cost or $2,500, whichever is greater. The Contractor must provide documentation showing under threshold in advance for the Engineer's consideration.
- Foreign steel may be allowed when the Contract contains an alternate item for a foreign source iron or steel product and the Contract is awarded based on the alternate item.

- The materials are temporarily installed or are supplies, tools, and equipment not incorporated into the project. Temporarily installed means the materials and products must be removed at the end of the project or may be removed at the Contractor's convenience with the Engineer's approval.

# Special Specification 7004
# Water Mains

## 1. DESCRIPTION

Furnish labor, materials, and equipment necessary to provide a complete water main system in conformance with the plans and Specifications, and in compliance with the Department's Utility Accommodations Policy (43 TAC § 21.31–21.55). Construct water mains of the sizes, materials, and dimensions shown on the plans, including pipe, joints, and connections to new and existing pipes; casing; valves; fittings; fire hydrants; meters; and blocking, as many as may be required to complete the work.

Furnish material and equipment for encasing existing water lines with split steel encasement pipes using the open-cut method in accordance with this Specification.

The abbreviations AWWA, ASA, ASTM, ANSI, AASHTO, NACE, NSF, SSPC, and TCEQ used in this Specification refer to the following organizations or technical societies.

- **AWWA**. American Water Works Association.
- **ASA**. American Standards Association.
- **ASTM**. American Society for Testing and Materials.
- **ANSI**. American National Standards Institute.
- **AASHTO**. American Association of State Highway and Transportation Officials.
- **NACE**. National Association of Corrosion Engineers.
- **NSF**. National Sanitation Foundation.
- **SSPC**. Steel Structures Painting Council.
- **TCEQ**. Texas Commission on Environmental Quality.

References to specifications of the above organizations mean the latest standard or tentative standard in effect on the date of the proposal.

## 2. MATERIALS

All materials must conform to the requirements of this Item, the plans, and the following Items.

- Item 421, "Hydraulic Cement Concrete"
- Item 440, "Reinforcement for Concrete"
- Item 441, "Steel Structures"
- Item 465, "Junction Boxes, Manholes, and Inlets"
- Item 471, "Frames, Grates, Rings, and Covers"

2.1. **General**. Provide new and unused materials for this project unless otherwise stated on the plans or in the proposal.

Pipe 6 in. or larger is acceptable to the Texas Fire Insurance Commission without penalty for use in water works distribution systems.

For water mains less than 24 in. in diameter, use casing insulators between the water main and casing unless otherwise shown on the plans. For water mains 4 in.–14 in., use 8-in. wide casing insulators.

For water mains 16 in.–20 in., use 12-in. wide insulators. For pipe materials up to 12 in., use Pipeline Seal and Insulator Model C8G-2 or approved equal. For water mains larger than 12 in., use Pipeline Seal and Insulator Model C12G-2 or approved equal. For casing end seals, use Pipeline Seal and Insulator Model C or approved equal.

2.2. **Steel Pipe and Fittings**.

2.2.1. **Steel Carrier Pipe**. Provide steel pipe for use as carrier pipe in the distribution system, conforming to AWWA C 200. Install steel pipe 20 in. or smaller as aerial crossings, aboveground piping, and for encasement sleeves only. Do not bury steel pipe that is 20 in. or smaller directly or within a casing.

For pipe 24 in. or greater, conform to AWWA C 200, C 207, C 208, and M 11, except as modified in this Specification. Furnish pipe and fittings that have manufacturer's certifications ensuring that they have been hydrostatically tested at the factory in accordance with AWWA C 200, Section 3.4. Ensure pipe steel meets ASTM A36; ASTM A570, Grade 36; ASTM A53, Grade B; ASTM A135, Grade B; or ASTM A139, Grade B, at minimum. Pipe is also subject to UL specification *Steel Pipelines for Underground Water Service*.

Provide pipe and fittings to withstand the most critical simultaneous application of external loads and internal pressures based on the minimum of AASHTO HS-20 loading, AREMA E-80 loads, depths of bury as indicated on the plans, and the most critical groundwater level condition. The pipe design conditions follow.

- **Working pressure**. 100 psi.
- **Hydrostatic field test pressure**. 150 psi.

For pipe design (24 in. and larger), conform to AWWA M 11 with the following conditions.

- **Design Stress Due to Working Pressure**. The maximum is 50% of the minimum yield strength or 16,500-psi maximum stress for mortar-coated pipe.
- **Design Stress Due to Hydraulic Test Pressure**. The maximum is 75% of the minimum yield strength or 24,750-psi maximum stress for mortar-coated pipe.
- **Modulus of Soil Reaction (E')**. <1,500 psi.
- **Unit Weight of Fill (w)**. >120 pcf.
- **Deflection Lag Factor (D1)**. 1.2.
- **Bedding Constant (K)**. 0.1.
- **Fully Saturated Soil Conditions**. hw = h = depth of cover above top of pipe.
- **Maximum Deflection from Specified Diameter**. 3% for flexible coatings.

Provide pipe and fittings that have been designed by a licensed professional engineer. Before manufacturing, submit these signed, sealed, and dated calculations for approval.

Supply pipe in double random lengths unless otherwise shown on the plans. Bevel the ends of the pipe for field butt-welding as shown on the plans.

Provide a minimum 3/8-in. inside joint recess between ends of pipe in straight pipe sections.

Provide a minimum allowable steel wall thickness in accordance with Table 1 and Table 2 for HS-20 live loads and depths of bury up to 16 ft.

**Table 1**
**Carrier Pipe (20 in. and Smaller)**

| Nominal Pipe Size (in.) | Outside Diameter (OD) (in.) | Min Wall Thickness (in.) | Approximate Weight per Foot, Uncoated (lb.) |
|---|---|---|---|
| 4 | 4.500 | 0.250 | 11.35 |
| 6 | 6.625 | 0.280 | 18.97 |
| 8 | 8.625 | 0.322 | 28.55 |
| 10 | 10.750 | 0.365 | 40.48 |
| 12 | 12.750 | 0.375 | 49.56 |
| 16 | 16.000 | 0.375 | 62.58 |
| 20 | 20.000 | 0.375 | 78.60 |

**Table 2**
**Carrier Pipe (24 in. and Larger)**

| Net Inside Diameter (ID) (in.) | Min Wall Thickness (in.) | |
|---|---|---|
| | Flexible Coating | Mortar Coating |
| 24 | 0.149 | 0.136 |
| 30 | 0.149 | 0.136 |
| 36 | 0.178 | 0.163 |

Note—Refer to the plans for carrier pipe thickness. However, never use a pipe wall thickness less than that defined in Table 1 and Table 2.

2.2.2. **Steel Casing Pipe**. Ensure pipe intended for use as casing pipe is manufactured in accordance with Section 2.2.1., "Steel Carrier Pipe," but ensure that the minimum allowable steel wall thickness conforms to those shown in Table 3 for HS-20 live loads and depth of bury of up to 16 ft.

**Table 3**
**Casing Pipe (Encasement Sleeves)**

| 30 in. and Smaller | | | |
|---|---|---|---|
| Casing Pipe Size (in.) | OD (in.) | Min Wall Thickness (in.) | Approximate Weight per Foot, Uncoated (lb.) |
| 8 | 8.625 | 0.219 | 19.64 |
| 10 | 10.750 | 0.219 | 24.60 |
| 12 | 12.750 | 0.219 | 29.28 |
| 16 | 16.000 | 0.219 | 36.86 |
| 18 | 18.000 | 0.250 | 47.39 |
| 20 | 20.000 | 0.250 | 52.73 |
| 24 | 24.000 | 0.250 | 63.41 |
| 30 | 30.000 | 0.250 | 79.43 |

Note—Refer to the plans for casing thickness. However, never use a pipe wall thickness less than that defined herein.

Provide steel casing sections for split casing in lengths a maximum 20 ft. Ensure each section is split in half sections. Bevel the ends and split sections for field butt-welding.

Steel casing pipe is not required to carry the UL label.

2.2.3. **Steel Pipe Fittings**. Provide factory-forged steel pipe fittings unless otherwise shown on the plans. Ensure the wall thickness is equal to or greater than the pipe to which the fitting is to be welded. Bevel the ends of the fitting for field butt-welding.

Provide approved sleeve-type flexible and flange adaptor couplings. Ensure the thickness of the middle ring is equal to or greater than the thickness of the pipe wall.

Provide restraint joint connections for 16-in. and larger water main piping shown on the plans to have restraint lengths, unless otherwise shown on the plans. Joints must be double-welded at butt or lap joints at aerial crossings as shown on the plans. Use flanged joint at valves.

2.2.3.1. **Elbows**. Provide two-piece for 0°–22.5°, three-piece for 23°–45°, four-piece for 46°–67.5°, and five-piece for 68°–90°, unless otherwise shown on plans.

2.2.3.2. **Outlets**. Outlets must be reinforced in accordance with AWWA M 11, Section 13.3–Section 13.7; AWWA C 200; and AWWA C 208. Provide interior lining and exterior coating in accordance with paragraphs pertinent to coating and lining, and matching pipe to access inlets, service outlets, test inlets, and air vacuum valve and other outlets, including riser pipes.

2.2.3.3. **Radius**. The minimum radius is 2.5 times pipe diameter.

2.2.4. **Hydrostatic Test of Pipe**. Ensure the pipe manufacturer performs hydrostatic testing in accordance with AWWA C 200, Section 3.5.3, at the point of manufacture; conducts the test for at least 2 min.; and thoroughly inspects the pipe. Repair or reject pipe revealing leaks or cracks. Obtain from the manufacturer and submit to the Engineer the manufacturer's written certification that the pipe and fittings used on this project have passed the hydrostatic test.

Calibrate pressure gauges within 1 yr. before testing, as specified in AWWA C 200, Section 1.04 L.

2.2.5. **Butt Straps for Closure Piece**. Provide a minimum 12-in. wide split butt strap, minimum plate thickness equal to the thinnest member being joined, and fabricated from material equal in chemical and physical properties to the thinnest member being joined.

Provide a minimum lap of 4 in. between the member being joined and the edge of the butt strap, welded on the inside and outside, unless otherwise approved.

Provide a minimum 6-in. welded outlet for inspecting each closure section, unless the access manway is within 40 ft. of the closure section. Provide forged-steel threaded outlets of approved design, where required, for use in passing hose or lead wires into the pipe. Tap plugs with standard pipe threads and weld to the pipe in an approved manner, using solid forged-steel plugs for closure.

Provide full-penetration butt or welded joints as shown on the plans. Use flanged joints at valves unless otherwise shown on the plans. Perform X-ray or ultrasonic testing of manual welds on special pipe and fittings.

Provide dished head plugs (test plugs) to withstand field hydrostatic test pressure from either side of the plug. Ensure the design stress due to hydrostatic pressure is at most 50% of minimum yield. Pipe on the opposite side of the hydrostatic test may or may not contain water. Ensure the manufacturer of the steel pipe hydrostatically tests the plugs at the factory.

Make curves and bends by deflecting joints, by using beveled joints, or by combining these methods, unless otherwise shown on the plans. Do not exceed the joint deflection angle recommended by the pipe manufacturer.

Make penetration of spigot into bell at all points of circumference at least equal to minimum required penetration shown on the plans. Provide beveled pipe sections used in curved alignment of standard length, except when shorter sections are required to limit the radius of curvature. In this case, provide equal-length sections throughout the curve. Do not allow the bevel to exceed 5°.

2.2.6. **Steel Pipe Flanges**. Ensure steel pipe flanges shown on the plans conform to AWWA C 207 for Class D flanges (same diameter and drilling as Class 125 cast iron flanges, ASA B 16.1).

Make cast-iron-to-steel pipe connections with one cast iron bell flange and one steel slip-on flange, and ensure they are electrically isolated.

The use of insulating gaskets, plastic bolt sleeves, and washers of insulating gasket material backed with zinc-plated or hot-dip galvanized washers, or epoxy-coated bolts, nuts, and washers used with an insulating gasket, is approved for this purpose.

For inline flange joints 12 in. in diameter and greater and for butterfly valve flanges, use Pyrex LineBacker Type E phenolic gaskets manufactured by Pipeline Seal and Insulator, Inc., or approved equal.

Use full-face gaskets for other flanged joints not listed above. Provide cloth-inserted rubber gasket material, 1/8 in. thick in accordance with AWWA C 207. Ensure gaskets are factory-cut to proper dimensions.

Maintain electrically isolated flanged joints between steel and cast iron by using epoxy-coated bolts, nuts, washers, and insulating-type gaskets, unless otherwise approved.

Fabricate flanges with oversize bolt holes, with flanges drilled in pairs, to accommodate insulating sleeves.

2.2.7. **Steel Pipe Protective Coatings**.

2.2.7.1. **General**. Use shop-applied protective coatings except for field repairs and coatings of field-welded joints. The Engineer may provide for witness of inspection and testing of shop-applied coatings; however, such witness does not relieve the Contractor of the responsibility to furnish material, perform work, and provide quality control (QC) in conformance with the applicable AWWA standard and these Specifications.

The substrate surface profile and minimum and maximum individual and total dry film thickness (DFT) indicated in this Specification apply. No requirement of this Specification cancels or supersedes the specific written directions and recommendations of the specific coating manufacturer so that the integrity of the applied system is not jeopardized. Measure the DFT in accordance with SSPC-PA 2.

Field-test shop coating and field repairs for holidays, pinholes, or discontinuities, at voltage levels required by the applicable AWWA standard and in accordance with the applicable NACE procedure (e.g., PRO 188, RPO 274, or TMD 384). Submit the test procedure, including voltage levels to be used, before testing. Repair holidays in conformance with the applicable AWWA standard.

Provide documentation by a NACE-certified inspector of compliance with the required tests.

Handle, store, and use field procedures for shop-coated pipe in conformance with the applicable AWWA standards. Adequately seal and protect pipe ends from damage during handling and storage. Do not remove such protection until immediately before installing. Do not lift pipe using caliper clamps or hooks at ends of the pipe.

Repair damage to the pipe or the protective coating caused while installing the pipe and before final acceptance by the owner, as directed and in conformance with the applicable standards.

Keep the interior of the pipe and fittings clean of foreign matter before installing and until the work is accepted. Keep joint contact surfaces clean until jointing is complete.

Furnish an affidavit of compliance that all materials and work furnished comply with the applicable AWWA standard and these Specifications.

2.2.7.2. **Internal Lining for Steel**. Ensure the material used for the internal coating of the steel carrier pipe is NSF-61 listed as suitable for contact with potable water as required by TCEQ, Chapter 290, “Rules & Regulations for Public Systems.”

Supply steel pipe with epoxy lining, capable of conveying water at temperatures no greater than 140°F. Provide linings conforming to ANSI/NSF 61, and certification from an organization accredited by ANSI. Unless otherwise noted, coat exposed (wetted) steel parts of flanges, blind flanges, bolts, and access manhole covers with epoxy lining as specified.

2.2.7.2.1. **Epoxy Lining**. Use liquid epoxy meeting AWWA C 210, "Liquid Epoxy Coating System for the Interior and Exterior of Steel Water Pipelines," except as modified in this Specification. Provide a liquid epoxy system consisting of three coats of polyamide epoxy (no coal-tar material) as follows.

- **Prime Coat**. Two-part, chemically cured, NSF-certified epoxy, 4-mil–6-mil DFT.
- **Intermediate Coat**. Two-part NSF-certified epoxy, 4 mils–6 mils (DFT).
- **Finish Coat**. Two-part NSF-certified epoxy, 4 mils–6 mils (DFT).

Ensure the total system has a minimum DFT of 12 mils and a maximum DFT of 18 mils. Apply each coat in contrasting colors, using a buff prime and intermediate coat and a white finish coat. Use the same manufacturer to supply all material. Coal-tar epoxy material is not permitted. For surfaces to be coated, abrasive-blast clean them to a near-white finish in accordance with SSPC-5(64) to establish an average anchor profile of 2.0 mils–3.0 mils, with no individual reading greater than 4.0 mils or less than 1.5 mils. Before applying, inspect the prepared and cleaned surface for evidence of nonvisible contaminants such as soluble salts or chlorides in accordance with NACE Technical Committee Report *Surface Preparation of Contaminated Steel Surfaces*, NACE Publication 6G 186.

Reclean the surface as necessary, until it is free of such contaminants.

Perform an interior adhesion test on pipe 30 in. in diameter and larger in accordance with ASTM D4541.

Minimum field adhesion must be 700 psi. Perform this test on pipe for project at a frequency of one for every 1,000 sq. ft. of epoxy lining. Perform a cure test in accordance with ASTM D4752 (solvent rub test) and ASTM D3363 (pencil hardness) for each section of pipe. Repair tested areas using approved procedures.

Provide fusion-bonded epoxy in accordance with AWWA C 213, "Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines."

2.2.7.3. **External Coating**.

2.2.7.3.1. **Above Ground**. Externally coat aboveground steel piping and fittings with a three-coat epoxy/epoxy/polyurethane system in accordance with AWWA C 218, "Coating the Exterior of Aboveground Steel Water Pipelines and Fittings," Section 2.5, Coating System No. 4-91, except as modified in this Specification.

- **Prime Coat**. Two-component, inhibitive epoxy primer, DFT of 4 mils–6 mils.
- **Intermediate Coat**. Two-component, chemical-resistant epoxy, DFT of 4 mils–6 mils.
- **Finish Coat**. Two-component aliphatic polyurethane, DFT 1.5 mils–2.5 mils.

Ensure the total system has a minimum DFT of 9.5 mils and a maximum DFT of 14.5 mils. Apply each coat in contrasting colors, using a buff prime coat and a blue finish coat, or as directed. Use the same manufacturer to supply all material. For surfaces to be coated, abrasive-blast clean them to a near-white finish in accordance with SSPC-SP 10 (NACE 2) to establish an average anchor profile of 2.0 mils–3.0 mils, with no individual reading greater than 4.0 mils or less than 1.5 mils. Before coating, inspect the prepared and cleaned surface for evidence of nonvisible contaminants such as soluble salts or chlorides in accordance with NACE Technical Committee Report *Surface Preparation of Contaminated Steel Surfaces*, NACE Publication 6G 186. Reclean the surface as necessary, until it is free of such contaminants.

Perform an interior adhesion test on pipe 30 in. in diameter and larger in accordance with ASTM D4541. Minimum field adhesion must be 700 psi. Perform this test on pipe for the project at a frequency of one for

every 1,000 sq. ft. of epoxy lining. Perform a cure test in accordance with ASTM D4752 (solvent rub test) and ASTM D3363 (pencil hardness) for each section of pipe. Repair tested areas using approved procedures.

Provide fusion-bonded epoxy in accordance with AWWA C 213, "Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines."

2.2.7.3.2. **Buried Steel Pipe, 24-in. Diameter and Larger Only**. Coat buried steel pipe and fittings (except tunneled, cased, or augered holes) using either of the following systems.

2.2.7.3.2.1. **Tape Coating**. Provide an approved tape for external tape coating. Apply in accordance with AWWA C 214 and this Section, 80-mil shop-applied Polyken YG-III, Tek-Rap Yard-Rap, or approved equal. Components must include primer, one 20-mil layer of inner-layer tape for corrosion protection, and two 30-mil layers of outer-layer tape for mechanical protection. Bond coupling to adjacent pipes with bonding cables as shown on the plans.

Use approved filler putty, Type Polyken 939 insulating putty, or approved equal, to fill in the gap and create a smooth sloped transition between the top of the reinforcing plate and the pipe, before applying the tape coating.

Primer compatible with the tape coating must be supplied by the coating system manufacturer.

Provide pipe with shop coatings cut back approximately 4 in.–4-1/2 in. from the joint ends to facilitate joining and welding of pipe. Taper successive tape layers by 1-in. staggers to facilitate field-wrapping and welding of joints. Inner and outer tape width must be 12 in. or 18 in.

Do not expose tape coating to direct sunlight for more than 60 days.

Wrap specials and fittings that cannot be machine-wrapped due to configuration with primer layer and two layers of prefabricated tape, each 35 mils thick. Overlap machine-applied tape with hand-applied tape by at least 2 in. and bind to it.

Apply Polyken approved 30-mil Filler Tape 931, or approved equal, parallel to spiral weld seams if weld height measures greater than or equal to 1/8 in.

2.2.7.3.2.2. **Polyurethane Coating**. Refer to Section 2.2.7.3.1., "Above Ground." Heat-shrink joint sleeves for tape coating must be Aqua-shield or approved equal. For repairs to heat-shrink joint sleeves, use Aqua-shield repair patch kit, or approved equal.

2.2.7.3.3. **Steel Pipe in Tunneled, Cased, Bored, or Augered Holes**.

2.2.7.3.3.1. **24-in. and Larger**. Prime steel pipe in tunneled or cased holes with 3.0 mils–4.0 mils of a two-part chemically cured rust-inhibitive polyamide epoxy. Prepare the surface the same as for aboveground external coating in accordance with Section 2.2.7.3.1., "Above Ground." Fill the annular space between the tunnel or casing with the specified grout.

2.2.7.3.3.2. **20-in. and Smaller**. Coat steel pipe in bored or augered holes, or holes in a tunnel or casing, with Corropipe II-TX or Corroclad 2000 as manufactured by Madison Chemical Industries, Inc., or approved equal, and apply in strict conformance with the manufacturer's recommendations.

For external field welds and other field repairs, use Madison Chemical "GP" II or "TX" Touch Up, or approved equal, in conformance with the manufacturer's recommendations.

2.2.7.4. **Inspections and Testing of Coatings**. Perform electrical inspection on the inner layer of tape before applying the intermediate layer of tape. If holidays are detected, repair holidays immediately before applying the outer layer of tape. Clear the holiday area of material and reprime if necessary. Recoat the area with

inner wrap tape. Overlap the inner wrap tape onto the surrounding inner wrap coating by at least 2 in. Perform an electrical retest at the repaired area after repairing the holiday, and before continuing the outer wrap.

Perform an electrical inspection on the shrink wrap to check for holidays. Perform peel tests over the heat-affected zone. Minimum acceptable result is 15 lb. ft. per inch.

2.3. **Ductile Iron Pipe (DIP) and Fittings**.

2.3.1. **DIP**. Provide DIP conforming to AWWA C 151. Provide minimum lengths of 18 ft. and minimum thickness of Class 51 for water lines. Provide minimum thickness of Class 53 for flanged pipe and minimum thickness of Class 52 for areas with pipe offset sections. Use joints of the push-on type or flanged type unless otherwise shown on the plans. Use push-on joints conforming to ASA A 21.11 (AWWA C 111). Use flanged joints conforming to AWWA C 115, including a cloth inserted rubber gasket material 1/8 in. thick for flanged joints. Do not use threaded- or grooved-type joints, which would reduce the pipe wall thickness below the minimum required.

Provide polyethylene encasement material and install in accordance with AWWA C 105, and backfill as specified. Apply at least two complete wraps of 8-mil thick polyethylene. Use polyethylene encasement for open-cut installations only. For augered sections or sections installed inside a tunnel or casing, provide polyurethane coating.

Ensure the pipe manufacturer performs hydrostatic testing in accordance with AWWA C 151, Section 5.2.1, at the point of manufacture; conducts the test for at least 2 min.; and thoroughly inspects the pipe. Repair or reject pipe revealing leaks or cracks. Obtain from the manufacturer and submit to the Engineer the manufacturer's written certification that the pipe and fittings used on this project have passed the hydrostatic test.

Prevent any lateral movement of thrust restraints throughout the pressure-testing and operation. Passive resistance of soil is not permitted in the calculation of thrust restraint.

Clearly mark the pipe section to show the location and thickness or pressure class color code.

Provide an exterior coating, in open-cut excavations, consisting of a prime coat and an outside asphaltic coating conforming to AWWA C 110, C 115, or C 151 for pipe and fittings. Encase the water line in a double wrap of polyethylene. Use polyethylene wrap conforming to Section 2.13., "Polyethylene Film Wrap," and Section 3.16., "Polyethylene Film Wrap." Install bond wire as specified.

Coat DIP in augered holes with a polyurethane coating. Use a polyurethane coating conforming to the same requirements as those in Section 2.2.7.3.3., "Steel Pipe in Tunneled, Cased, Bored, or Augered Holes."

2.3.2. **Fittings for DIP**. Ensure fittings for use with DIP of nominal sizes 4 in.–48 in. conform to AWWA C 110 or AWWA C 153.

Use joints of the push-on type or flanged type unless otherwise shown on the plans. Use push-on joints conforming to ANSI A 21.11 (AWWA C 111), rated for a 250-pounds per square inch gauge (psig) working pressure, or AWWA A 21.53 (AWWA C 153). Use flanged fittings conforming to AWWA C 110, of cast or ductile iron and conforming to ANSI B 16.1, Class 125, rated at 250-psig working pressure. Screw flanged fittings on threaded pipe ends done in the shop in accordance with AWWA C 115 for attaching, aligning, and facing.

Coat the inside and outside surfaces of the fittings as specified for the regular lengths of DIP.

Regardless of the coating system, for flanged joints in buried service, provide a petrolatum wrapping system, Denso, or approved equal, for the complete joint and alloy steel fasteners. Alternately, provide bolts made of Type 304 stainless steel.

Bond joints in accordance with Section 2.6., "Joint Bonding and Electrical Insulation."

2.3.3. **Restrained Joints**. For buried services, restrain DIP 16 in. in diameter and larger from movement, using special joints. Provide the following or approved equal.

- Super-Lock Joint by Clow Corporation
- Flex-Ring or Lok-Ring by American Cast Iron Pipe Company
- TR-Flex or Field-Lok Joint by U.S. Pipe and Foundry Company

Provide restrained joints with enough distance from each side of the bend, tee, plug, or other fitting to resist thrust developed at the design pressure for the pipe.

Use water main interior coatings conforming to AWWA C 104 or ANSI A 21.4, cement-lined with seal coat, or ANSI A 21.16 fusion-bonded epoxy coating.

Ensure the material used for internal coating is NSF 61 and listed as suitable for contact with potable water as required by Texas Natural Resources Conservation Commission, Chapter 290, "Rules and Regulation for Public Water Systems."

2.4. **Polyvinyl Chloride (PVC) Pipe and Fittings**.

2.4.1. **PVC Pipe, 2-in.–20-in**. Provide PVC pipe 4 in. and larger with integral bell-type gasketed push-on joints or plain-end pipe with twin-gasketed couplings conforming to ASTM D 3139 for push-on type joints. Use rubber gaskets conforming to ASTM D 1869. Lubricate gaskets with a nontoxic water-soluble lubricant before joining pipe units. Fit pipe units together in a manner to avoid twisting or damaging the rubber gasket.

Mark furnished PVC pipe on the spigot end for proper depth of makeup to the bell end of a joining length of pipe or fitting.

Provide valves for use with PVC pipe conforming to Section 2.9., "Gate Valves, Tapping Valves, and Tapping Sleeves," but provide valve ends of the push-on joint type for use with PVC pipe. Provide self-extinguishing PVC pipe that bears the UL mark of approval and is acceptable without penalty to Texas State Fire Insurance Committee for use in fire protection lines. Ensure PVC pipe bears the NSF Seal of Approval (NSF-PW).

Provide PVC meeting the following thicknesses when using restrained joints.

- **DR 18**. For restrained joints where shown on the plans.
- **DR 14**. For alternate to offset pipe sections shown on the plans. Do not use PVC pipe for offset sections with depth cover greater than 20 ft. or less than 4 ft. Do not use PVC pipe in potentially petroleum-contaminated areas.

Make curves and bends by deflecting joints. Do not exceed the maximum deflection recommended by the pipe manufacturer. Submit details of other methods of providing curves and bends for review by the Engineer.

2.4.1.1. **Gaskets**. Use gaskets meeting ASTM F 477. Use elastomeric factory-installed gaskets to make joints flexible and watertight.

2.4.1.2. **Flat Face Mating Flange**. Full faces 1/8-in. thick ethylene propylene rubber (EPR).

2.4.1.3. **Raised Face Mating Flange**. Flat ring 1/8-in. EPR, with filler gasket between the OD of the raised face and the flange OD to protect the flange from the bolting moment.

2.4.1.4. **Lubricant for Rubber-Gasketed Joints**. Water-soluble, nontoxic, and nonobjectionable in taste and odor imparted to fluid; nonsupporting of bacteria growth; and causing no deteriorating effect on PVC or rubber gaskets.

Use one manufacturer to furnish PVC pipe. When an approved PVC system is used as alternate to offset pipe section, a second manufacturer may be used. Do not use PVC pipe in potentially or known contaminated areas. Do not use PVC pipe in areas exposed to direct sunlight.

Ensure the pipe manufacturer performs hydrostatic testing in accordance with AWWA C 900, AWWA C 905, AWWA C 909, and ANSI A 21.10 (AWWA C 110) at the point of manufacture. Obtain from the manufacturer and submit to the Engineer the manufacturer's written certification that the pipe and fittings used on this project have passed the hydrostatic test.

2.4.2. **Fittings for PVC Pipe, 2-in**. Provide PVC pipe manufactured in accordance with ASTM D1784 for PVC 12454B (Type I, Grade 1) or PVC 12454C (Type I, Grade 1) and with a standard thermoplastic pipe dimension ratio equal to 21.

Use fittings for 2-in. PVC pipe with a minimum pressure rating of 200 psi. Use fittings of the solvent-weld, socket-type conforming to ASTM D2466, or the gasketed push-on type conforming to ASTM D2241. Use PVC solvent cements manufactured in accordance with ASTM D2564.

2.4.3. **PVC Pipe, 4-in.–20-in**.

- **PVC Pipe 4-in.–12-in**. AWWA C 900; AWWA C 909, Class 150, DR 18; AWWA C 900, Class 200, DR 14, as alternate to offset pipe sections; nominal 20-ft. lengths; cast-iron equivalent ODs.
- **Pipe 14-in.–20-in**. AWWA C 905, Class 235, DR 18; nominal 20-ft. lengths; cast-iron equivalent OD.

Use joints conforming to the same requirements as those specified for 2-in. PVC pipe.

2.4.4. **Bends and Fittings for PVC Pipe, 4-in.–20-in**. Provide fittings conforming to Section 2.3.2., "Fittings for DIP." Use polyethylene-wrapped fittings as required by Section 2.13., "Polyethylene Film Wrap," and Section 3.16., "Polyethylene Film Wrap."

Provide restrained joints with enough distance from each side of the bend, tee, plug, or other fitting to resist thrust developed at the design pressure for the pipe.

Approved Certa-Lok PVC restrained joints, 200 psi–250 psi, may be provided for up to 12 in. in diameter. Where preventing movements of 12-in. diameter or greater pipe due to thrusts is necessary, provide the following restrained joints, or approved equal.

2.4.4.1. **Fittings**. JCM 610 Sur-Grip Fitting Restrainer by JCM Industries, Inc., or Series 500 Fitting Restrainer by Ebba Iron, Inc.; One Bolt by One Bolt, Inc.; or approved equal.

2.4.4.2. **Bell and Spigot**. JCM 620 or 621 Sur-Grip Bell Joint Restrainer by JCM Industries, Inc., or Series 1500 or Series 1100HV Joint Restrainer by Ebba Iron, Inc.; One Bolt by One Bolt, Inc.; or approved equal.

2.4.5. **Nonmetallic Pipe Detection.** Where nonmetallic pipe is installed longitudinally under ground, provide for a method of detecting the location of the nonmetallic pipe. The specific method is shown on the plans or will be approved. This system may involve some components to be installed in the trench around the pipe to be detected using a metal detector. Or the system may consist of locating equipment capable of creating a nondestructive pressure wave that can be detected above ground using a portable detection device with audible and visual indicators. Ensure either system of detection is capable of accurately locating the pipe to a maximum depth of 3 ft. over the areas shown on the plans.

Either system must be capable of locating lines under earth, concrete, or asphaltic surfaces. Use equipment, materials, and installation as specified by the manufacturer.

2.5. **Fiberglass-Reinforced Plastic (FRP) Pipe for Casing**.

2.5.1. **FRP Casing Pipe**. Ensure pipe used for casing is centrifugally cast fiberglass pipe conforming to AWWA C 950 and this Section.

Design fiberglass casing pipe wall thickness to withstand the most critical simultaneous application of external loads, including construction loads and internal pressures. Base the design on the minimum of AASHTO HS-20 loading, AREMA E-80 loads, and depths of bury as indicated on the plans. Design for the most critical groundwater level condition. The pipe design conditions follow.

- **Working Pressure**. 100 psi.
- **Hydrostatic Field Test Pressure**. 150 psi.

Provide the pipe with pressure-rated fiberglass sleeve couplings or O-ring bell-and-spigot joints that use elastomeric sealing gaskets to maintain joint watertightness conforming to ASTM D 4161. Provide the casing end treatments with rubber-boot type seals capable of maintaining casing watertightness. Provide casing pipe, gasketing, and end treatments that have a very low to zero corrosive reaction to the chemicals listed on the pipeline product lines shown on the plans. The pipeline products encountered at proposed water line crossings include, but are not limited to, the following.

- Methyl tertiary butyl ether
- Tertiary butyl arsine
- Nitrogen
- Benzene
- Petroleum
- Natural gas
- Ethane

Provide pipe manufactured with an epoxy vinyl ester resin with the physical and chemical properties of HETRON 970-35 by Ashland or approved equal.

Provide fiberglass casing sections in nominal lengths of 20 ft. Provide a stiffness class of fiberglass pipe that satisfies design requirements, but no less than 46 psi, when used in direct-bury operation. For tunneled and augered sections, use pipe and pipe joints designed to carry loads including, but not limited to, overburden and lateral earth pressures, subsurface soil, grouting, other conditions of service, thrust of jacks, and stress anticipated during handling and installation. Do not create grout holes using pipe.

Submit shop drawings signed and sealed by a licensed professional engineer in the State of Texas showing the following.

- Manufacturer's pipe design calculations, including thrust restraint design.
- Details of pictorial nature of critical features and specials indicating alignment and grade, laying dimensions, fabrication, fitting, flange, and fully dimensioned details, with plan view detailing pipe invert elevations, bends, and other critical features. Indicate station numbers for fittings corresponding to the plans. Do not start production of pipe and fittings before review and approval. Provide final approved lay schedule on CD-ROM in Adobe Portable Document Format (*.PDF).
- Certification from manufacturer that design was performed for the project in accordance with this Section. This certification must be signed and sealed by a licensed professional engineer in the State of Texas.
- Gasket and resin selection for approval.

2.6. **Joint Bonding and Electrical Insulation**. For electrical bond wires, use a minimum No. 2 AWG, seven-strand, copper cable, furnished with high molecular weight polyethylene (HMWPE) insulation. Remove 1 in. of HMWPE insulation from each end of the bond wire. Provide two bond wires as shown on the plans.

Provide a flange adaptor with an insulating kit, as required, when connecting new piping to existing piping and piping of different materials. Provide electrical flange insulation by the installation of the following materials.

2.6.1. **Insulating Gasket**.

2.6.1.1. **Piping Size 30 in. in Diameter and Greater**. Provide Pyrox G-10 with nitrile seal, Type E LineBacker gasket as manufactured by Pipeline Seal and Insulator, Inc., or approved equal.

2.6.1.2. **Piping Size Between 12 in. and 24 in. in Diameter**. Provide Phenolic PSI with nitrile seal, Type E LineBacker gasket as manufactured by Pipeline Seal and Insulator, Inc., or approved equal.

The Contractor may provide a plain-faced phenolic gasket, as manufactured by Pipeline Seal and Insulator, Inc., or approved equal. Place the phenolic gasket between two full-faced gaskets. Provide cloth-inserted rubber gasket material, 1/8 in. thick, in accordance with AWWA C 207. Use gaskets that are factory-cut to proper dimensions.

2.6.2. **Sleeves and Washers**.

2.6.2.1. **Piping Size 30 in. in Diameter and Greater**. Provide full-length Mylar sleeves with Pyrox G-10 washers, double-washer sets as manufactured by Pipeline Seal and Insulator, Inc., or equal.

2.6.2.2. **Piping Size Between 12 in. and 24 in. in Diameter**. Provide full-length Mylar sleeves with phenolic washers, double-washer sets as manufactured by Pipeline Seal and Insulator, Inc., or approved equal.

2.7. **Copper Tubing for Copper Service Lines and Small Mains**. For 3/4-in., 1-in., 1-1/2 in., and 2-in. diameter copper tubing for underground service, use Type K soft annealed and seamless with the proper bending temper and conforming to ASTM B88 and Federal Specification WW-T-799, with the following exceptions.

ASTM B88, Section 14, is modified to provide for one sample for each 7,500 ft. of tubing and items of less than 7,500 ft. of tubing.

Furnish 3/4-in. and 1-in. tubes in 60-ft. coils. Furnish 1-1/2 in. and 2-in. tubes in coils at least 40 ft. long. Use minimum joint spacing in multiples of 60 ft. or 40 ft., respectively.

Provide flared or compression-type brass fittings for use with Type K annealed copper tubing in accordance with AWWA C 800.

2.8. **Brass Fittings for Underground Services Lines and Small Mains (Less than 24 in. in Diameter)**.

2.8.1. **General**. Unless otherwise provided in this Specification, use brass fittings in underground installations of service lines and small mains in the water distribution system.

Use brass fittings consisting of Copper Alloy No. C 83600 conforming to ASTM B62. Ensure the general pattern for each fitting conforms to that of standard brass fittings as manufactured by Mueller Company, Hays Manufacturing Company, or an approved equal.

Compression fittings may be used for unions except where they occur under existing or future paving. Use compression tube fittings with Buna-N beveled gaskets.

Ensure each fitting has the manufacturer's name or trademark and size plainly stamped into or cast on the body. Provide straight pipe adjacent to fittings for at least 10 in.

Provide waterways no smaller in diameter than the nominal size of the stop and accurately finish to a watertight joint; face all nuts and washers to a true fit; and design them such that the joint remains watertight and easy to operate after repeated use over several years. Use external threads conforming to AWWA C 800, and, on corporation stops, protect them in shipment using plastic coatings or an alternate approved method.

2.8.2. **Corporation Stops**. Provide inlet ends of one of the following types.

- Standard corporation stop threads as specified in AWWA C 800, Table 1
- Iron pipe thread (permissible for use with service saddles only)
- Hays 4200–4202 or approved equal

Use one of the following types of valve body.

- Tapered plug
- O-ring seat ball
- Rubber seat ball

Provide outlet ends with a flared-copper connection for use with Type K soft copper or compression-type fitting.

For PVC pipe, provide all brass corporation stops specifically designed for use with PVC pipe.

2.8.3. **Curb Stops**. Provide inlet ends with flared copper connections or compression-type fittings.

Use a valve body with a straight-through or angled meter stop design equipped with padlock wings and of the O-ring seal straight plug type or the rubber seat ball type.

Provide the outlet with female iron pipe threads or swivel nut meter spud threads, 3/4-in. and 1-in. stops, and with two-hole flanges for 1-1/2 in. and 2-in. sizes.

2.8.4. **Service Saddles**. Provide service saddle with dual straps and one of the following types:

- Brass body and straps
- Ductile iron body and straps, vinyl-coated
- Ductile iron body, vinyl-coated with stainless steel straps

For taps for PVC water mains, use dual-strap or single, wide-band strap saddles that provide full support around the circumference of the pipe and a bearing area with enough width along the axis of the pipe, 2 in. minimum, to ensure that the pipe will not be distorted when the saddle is tightened. Use Romac Series 101N wide-band, stainless steel tapping saddle with AWWA standard thread (Mueller thread) or approved equal.

2.8.5. **Angle Stops**. Provide angle stops in accordance with AWWA C 800; ground-key stop type with bronze lock-wing head stop cap; inlet and outlet threads conforming to the application tables of AWWA C 800; and inlet side with a flared connection or Mueller 110 compression type, or an approved equal.

2.8.5.1. **Outlet for 3/4-in. and 1-in. Size**. Provide meter swivel nut with saddle support.

2.8.5.2. **Outlet for 1-1/2 in.–2-in. size**. Provide O-ring sealed meter flange, iron pipe threads.

2.8.6. **Fittings**. Provide fittings in accordance with AWWA C 800 and as described below.

2.8.6.1. **Castings**. Smooth, free of burrs, scales, blister, sand holes, and defects that would make them unfit for their intended use.

2.8.6.2. **Nuts**. Smooth cast and with symmetrical hexagonal wrench flats.

2.8.6.3. **Flare Joint Fittings**. Smooth cast. Machine seating surfaces for metal-to-metal seal, to proper taper or curve, free of any pits or protrusions.

2.8.6.4. **Thread Fittings**. Use National Pipe Taper (NPT) threads and protect male threaded ends in shipment using plastic coatings or other equally satisfactory means.

2.8.6.5. **Compression Tube Fittings**. Provide with a Buna-N beveled gasket.

Brass fittings require the following testing.

- Submerge in water for 10 sec. at 85 psi with stops in closed and open positions.
- Reject any fittings that show air leakage. The Department may confirm tests locally. An entire lot from which samples were taken will be rejected when random sampling discloses unsatisfactory fittings.

2.9. **Gate Valves, Tapping Valves, and Tapping Sleeves**.

2.9.1. **Gate Valves**. Use gate valves conforming to AWWA C 500, C 509, and C 515, and the following supplemental Specifications.

Provide direct-bury valves and valves in subsurface vaults that open clockwise. Prove aboveground valves that open counterclockwise.

If the type of valve is not indicated on the plans, use gate valves as line valves for sizes less than 20 in. If the type of valve is specified, no substitute is allowed.

Use a valve body of straight-through or angled, meter-stop design equipped with the following.

- **O-Ring Seal**. Straight plug type.
- **Rubber Seat**. Ball type.

Provide the outlet end with female iron-pipe threads or swivel-nut meter-spud threads on 3/4-in. and 1-in. stops, and with a two-hole flange on 1-1/2 in. and 2-in. sizes.

Where installing at depths greater than 4 ft., provide gate valves with a nonrising extension stem with a coupling able to attach securely to the operating nut of the valve. Terminate the upper end of the extension stem in a square wrench nut no deeper than 4 ft. from the finished grade. Support the extension stem with an arm attached to the wall of the manhole or structure that loosely holds the extension stem and allows rotation in the axial direction only.

Provide gate valves in factory-mutual type meter installations conforming to this Specification, with outside screw and yoke valves, and carrying the UL label.

Provide coatings in accordance with AWWA C 550, Indurall 3300 or approved equal, that are nontoxic; do not impart taste to water; function as a physical, chemical, and electrical barrier between the metal base and surroundings; and are a minimum 12-mil thick fusion-bonded epoxy. Before assembling the valve, apply the protective coating to the interior and exterior surfaces of the body.

Provide flange joints when the valve is connected to steel pipe.

Mount valves horizontally if the proper ground clearance cannot be achieved by a normal vertical installation. For horizontally mounted gate valves, provide bevel operation gear that is mounted vertically, for aboveground operation.

2.9.1.1. **Gate Valves 1-1/2 in. in Diameter and Smaller**. Use an operating pressure of 125 psi, bronze mounting, rising stem, single wedge, disc type, screwed ends, Crane No. 428 or approved equal.

2.9.1.2. **Gate Valves 2 in. in Diameter**. Use an iron body, double-gate, nonrising stem, 150-lb. test, 2-in. square nut operating clockwise to open.

2.9.1.3. **Gate Valves 4 in.–12 in. in Diameter**. Nondirectional; standard wall resilient-seated in accordance with AWWA C 509, parallel seat double-disc in accordance with AWWA C 500, or reduced wall resilient-seated gate valves AWWA C 515; operating pressure of 200 psi; bronze mounting; push-on bell ends with rubber joint rings and nut-operated unless otherwise specified; resilient-seated provided by American Darling AFC-500, US Pipe Metro Seal 200, or approved equal; reduced wall resilient-seated valves by American Flow Control Series 2500 or approved equal; double-disc provided by American Darling 52, Clow F-6102, or approved equal; and in compliance with the following unless otherwise shown on the plans.

2.9.1.3.1. **Design**. Fully encapsulated rubber wedge or rubber seat ring mechanically attached with minimum 304 stainless steel fasteners or screws. Threaded connection isolated from water by compressed rubber around opening.

2.9.1.3.2. **Body**. Cast or ductile iron. Flange bonnet and stuffing box together with ASTM A307, Grade B, bolts. Cast the manufacturer's initials, pressure rating, and year manufactured into the valve body.

2.9.1.3.3. **Bronze**. Ensure that the valve components in the waterway contain at most 15% zinc and at most 2% aluminum.

2.9.1.3.4. **Stems**. ASTM B763 bronze, Alloy No. 995; minimum yield strength of 40,000 psi; minimum elongation in 2 in. of 12%; and nonrising.

2.9.1.3.5. **O-Rings**. For AWWA C 509, Section 2.2.6 and Section 4.8.2. For AWWA C 500, Section 3.12.2. For AWWA C 515, Section 4.2.2.5.

2.9.1.3.6. **Stem Seals**. Consist of three O-rings, two above and one below the thrust collar, with an antifriction washer located above the thrust collar.

2.9.1.3.7. **Stem Nut**. Independent or integrally cast of ASTM B62 bronze.

2.9.1.3.8. **Resilient Wedge**. Molded; synthetic rubber; vulcanized and bonded to cast iron or ductile iron wedge tested to meet or exceed ASTM D429, Method B, or attached with 304 stainless steel screws; and seat against epoxy-coated surface in the valve body.

2.9.1.3.9. **Bolts**. Furnish in accordance with AWWA C 509, Section 2.2.5; AWWA C 500, Section 3.4; or AWWA C 515, Section 4.4.4, and stainless steel, cadmium-plated, or zinc-coated.

2.9.1.4. **Gate Valves 14 in. and Larger in Diameter**. AWWA C 500, parallel seat double-disc, or AWWA C 515; reduced wall, resilient-seated gate valves; flanged ends; and nut-operated unless otherwise specified. Provide reduced wall resilient-seated valves with 250-psig pressure rating and manufactured by American Flow Control Series 2500 or approved equal. Provide double-disc valves with 150-psig pressure rating and manufactured by American Darling 52, Clow F-6102, or approved equal. Comply with following requirements unless otherwise shown on the plans.

2.9.1.4.1. **Body**. Cast iron or ductile iron. Flange together bonnet and stuffing box with ASTM A307, Grade B, bolts. Cast the following into the valve body: manufacturer's initials, pressure rating, and year manufactured. When mounting horizontally, equip valves greater in diameter than 12 in. with rollers, tracks, and scrapers.

2.9.1.4.2. **O-Rings**. For AWWA C 500, Section 3.12.2. For AWWA C 515, Section 4.2.2.5.

2.9.1.4.3. **Stems**. ASTM B763 bronze, Alloy No. 995; minimum yield strength of 40,000 psi; minimum elongation in 2 in. of 12%; and nonrising.

2.9.1.4.4. **Stem Nuts**. Machined from ASTM B62 bronze rod with integral forged thrust collar machined to size, nonrising.

2.9.1.4.5. **Stem Seals**. Consisting of three O-rings, two above and one below the thrust collar, with an antifriction washer located above the thrust collar for operating torque.

2.9.1.4.6. **Bolts**. AWWA C 500, Section 3.4, or AWWA C 515, Section 4.4.4, and stainless steel cadmium-plated or zinc-coated.

2.9.1.4.7. **Discs**. Cast iron with bronze disc rings securely pinned into machined dovetailed grooves.

2.9.1.4.8. **Wedging Device**. Solid bronze or cast iron, bronze-mounted wedges. Thin plates or shapes integrally cast into cast iron surfaces are acceptable. Provide other moving surfaces integral to wedging action that are bronze Monel or nickel alloy-to-iron.

2.9.1.4.9. **Gear Cases**. Cast iron; furnished on 18-in. and larger valves and of extended type with steel side plates; lubricated; and gear case enclosed with oil seal or O-rings at shaft openings.

2.9.1.4.10. **Bronze Mounting**. Built as integral unit mounted over, or supported on, cast iron base and of sufficient dimensions to be structurally sound and adequate for imposed forces.

2.9.1.4.11. **Stuffing Boxes**. Located on the top of the bonnet and outside the gear case.

Provide a bypass for double-disc gate valves 24 in. and larger.

2.9.1.5. **Gate Valves 14 in.–36 in. in Diameter**. Provide AWWA C 515, reduced wall, resilient-seated gate valves with 250-psi pressure rating. Furnish with spur or bevel gearings.

Mount valves horizontally if proper ground clearance cannot be achieved by normal vertical installation. For horizontally mounted gate valves, provide bevel operation gear mounted vertically for aboveground operation.

Use valve body, bonnet, wedge, and operator nut constructed of ductile iron.

Fully encapsulate the exterior of the ductile iron wedge with rubber. Ensure the wedge is symmetrical and seals equally well with flow in either direction.

Provide bolts AWWA C 515, Section 4.4.4, stainless steel, and cadmium-plated or zinc-coated.

Provide high-strength bronze stem and nut.

Provide AWWA C 515, Section 4.2.2.5, pressure O-rings as gaskets. Provide stem sealed by three O-rings. The top two O-rings must be replaceable with the valve fully open at the full-rated working pressure. Provide thrust washers for the thrust collar for easy valve operation.

2.9.2. **Tapping Valves**. Provide double-disc or resilient-wedge type tapping valves meeting the requirements of gate valves, as listed in Section 2.9.1.5., "Gate Valves 14 in.–36 in. in Diameter," except for the type of joints, and inlet flanges meeting AWWA C 110, Class 125, or meeting AWWA C 110, Class 150, or higher, and with a minimum eight-hole flange. Provide outlets with standard mechanical or push-on type joints that fit any standard tapping machine.

Provide a valve seat opening such that a full-size shell cutter for the nominal size tap may pass through the valve without any contact with the valve body.

Provide valve boxes conforming to Section 2.11., "Valve Boxes."

2.9.3. **Tapping Sleeves**. Provide tapping sleeve bodies in accordance with AWWA C 110 ductile iron, or AWWA C 111 carbon steel, in two sections bolted together with high-strength, corrosion-resistant, low-alloy steel bolts, and with mechanical joint ends.

Provide flanged branch outlets of tapping sleeves, machine-recessed in accordance with AWWA C 207, Class D, ANSI 150-lb. drilling. Ensure the gasket is affixed around the recess of the tap opening to preclude rolling or binding during installation.

Provide tapping sleeves with a 3/4-in. NPT test opening for testing before tapping. Provide a 3/4-in. bronze plug for the opening.

2.9.3.1. **Steel Sleeves**. Do not use steel sleeves for taps greater than 75% of the pipe diameter.

Use steel sleeves only on pipe diameters 6 in. and larger. No size-on-size sleeve is permitted (e.g., 6 in. × 6 in.). To accomplish size-on-size connections, the next smaller tap may be made and a large end bell (LEB) increaser used. Where fire service from a 6-in. main is approved, only a ductile iron split sleeve is permitted.

Provide a body of heavy-welded steel construction. Groove the top half of the body to permanently retain a neoprene O-ring seal against the OD of the pipe.

Provide fusion-bonded steel sleeves, epoxy-coated to a minimum 12-mil thickness. Ensure the finished epoxy coat is free of laminations and blisters, does not peel, and remains pliant and resistant to impact. Ship steel sleeves in wooden crates that protect the epoxy coating during transport and storage.

Use bolts and nuts conforming to AWWA C 500, Section 3.5, and coated with a 100% vinyl resin (or made of corrosion-resistant material).

For steel tapping sleeves, use Smith Blair No. 622, Rockwell No. 623, JCM No. 412, or approved equal.

2.9.4. **Air Release and Vacuum Relief Valves**.

2.9.4.1. **Combination Air Valves**. Provide where combination air valves are designed to fulfill the functions of air release, permitting the air accumulated in the line at the high point of elevation to escape while the line is under pressure, and vacuum relief. For valve exterior, paint with shop-applied primer suitable for contact with potable water. Provide Apco Model 145C or Model 147C, Val-matic Series 200, or approved equal valves as shown on the plans.

2.9.4.2. **Air Release Valves**. Provide with flanged inlet and outlet connections as specified on the plans. For 2-in. and 3-in. single-body valves, size the orifice for a 100-psi working pressure. Fabricate the air relief valve of materials as follows: body and cover, ASTM A48, Class 30, cast iron; float and leverage mechanism, ASTM A240 or ASTM A276 stainless steel; and orifice and seat, stainless steel against Buna-N or Viton mechanically retained with hex head nut and bolt. Other valve internals must be stainless steel or bronze.

2.9.4.3. **Air Release and Vacuum Valves**. Provide single-body standard combination or duplex-body custom combination valves as shown on the plans.

2.9.4.3.1. **2-in. and 3-in. Single-Body Valves**. Provide inlet and outlet sizes as shown on the plans and an orifice sized for a 100-psi working pressure. Valve material Specifications are as follows.

- **Body, Cover, and Baffle**. ASTM A48, Class 35, or ASTM A126, Grade B, cast iron.
- **Plug or Poppet**. ASTM A276 stainless steel.
- **Float**. ASTM A240 stainless steel.
- **Seat**. Buna-N.
- **Other Valve Internals**. Stainless steel.

Paint valve exterior with an epoxy shop-applied primer. Provide Apco Model 145C or Model 147C, Val-Matic Series 200, or approved equal.

2.9.4.3.2. **3-in. and Larger Duplex-Body Valves**. As shown on the plans, provide an Apco Series 1700 with a No. 200 air release valve, GA Industries Fig. No. AR/GH-21K/280, or approved equal.

Air and vacuum valve material Specifications are as follows.

- **Body and Cover**. ASTM A48, Class 35, cast iron.
- **Float**. ASTM A240 stainless steel.
- **Seat**. Type 304 stainless steel and Buna-N.
- **Other Valve Internals**. Stainless steel or bronze.

Construct air release valve as specified in Section 2.9.4.2., “Air Release Valves.”

2.9.5. **External Coating Aboveground Valves**. Coat valves with a polyurethane coating conforming to Section 2.2.7.3.2.2., “Polyurethane Coating.”

2.10. **Butterfly Valves**. Provide butterfly valves and operators conforming to AWWA C 504, Class 150B, except as modified or supplemented in this Specification. Provide short-body valves with a flanged design for closing against a flow velocity of 16 ft. per second at a normal working pressure of 150 psi and with a downstream pressure of 0 psi (Class 150B).

Provide direct-bury valves and valves in subsurface vaults that open clockwise. Provide aboveground and plant valves that open counterclockwise.

Body must be cast iron, ASTM 126, Class B.

Discs for butterfly valves must be cast iron or ductile iron.

Provide valves with Buna-N or neoprene seats mounted either on the disc or in the body. Mechanically secure the seats, not relying solely on adhesive properties of epoxy or similar bonding agents to attach the seats to the body. Mechanically retain the seats on the disc using stainless steel (18-8) retaining rings held in place by stainless steel (18-8) cap screws that pass through a rubber seat for added retention. When the seat is on the disc, retain the seat in position using shoulders located on the disc and the stainless steel retaining ring. Provide mating surfaces for seats of Type 304 or Type 316 stainless steel, secured to the disc by mechanical means. Sprayed-on or plated mating surfaces are not allowed. Provide a cast iron disc conforming to ASTM A126, Class B, or ductile iron conforming to AWWA C 151. The seat must be replaceable in the field for valves greater than 30 in. in diameter. Valves with segmented retaining rings are not acceptable.

Coat interior wetted ferrous surfaces of the valve, including the disc, with epoxy suitable for potable water conditions. Furnish epoxy, perform surface preparation, and apply epoxy in accordance with AWWA C 550 and the coating manufacturer’s recommendations. Provide three coats of two-component, high-build epoxy

with a minimum dry thickness of 12 mils. Use Indurall 3300, or approved equal, epoxy coating. Holiday-test and measure the coatings for thickness.

Use Type 304 or Type 316 stainless steel for the valve shaft and keys, 24 in. in diameter and greater, that require at least 2 in., or taper pins used for attaching the valve shaft to the valve disc. Do not use a torque plug to attach the valve shaft to the valve disc. All portions of shaft bearings must be stainless steel, bronze, nylon, or Teflon (supported by fiberglass mat or backing material with a proven record of preventing Teflon flow under load) in accordance with AWWA C 504, stainless steel bearing material. Design the valve shaft to withstand three times the amount of torque necessary to the open the valve.

Packing must be field-adjustable, split-V type, and replaceable without removing the operator assembly.

Retaining hardware for seats must be Type 304 or Type 316 stainless steel. Nuts and screws used with clamps and discs for rubber seats must be securely held using locktight or other approved method to prevent loosening by vibration or cavitational effects.

Seat the valve disc in a position 90° to the pipe axis and ensure it rotates 90° between the fully opened and tightly closed position. Install valves with valve shafts horizontal and the convex side of the disc facing the anticipated direction of flow, except where shown otherwise on the plans.

Use push-on or flanged (flanged valves coupled to Bell-Flange adapters may be used) joint types for installation with cast iron pipe or DIP. Use flanges conforming in dimensions and drilling to ANSI B 16.1 for cast iron body valves, Class 125. Use bolts conforming to AWWA C 500, Section 9, in valve installations, including bolts for operators and housing. Use flanged joints for steel or concrete steel cylinder pipes.

Provide properly sized gear-type actuators for valves 8 in. and larger. Provide fully enclosed and traveling-nut type, rack-and-pinion type, or worm-gear type gear actuators. Equip direct-bury valves with a 2-in. square nut operating clockwise to open the valve. Completely enclose the space between the actuator housing and the valve body. Ensure that no moving parts are exposed to the soil or elements. Provide oiltight and watertight actuators, factory-packed with suitable grease. Use operators conforming to AWWA C 504 and equipped with adjustable limit stop devices.

Design worm-gear and traveling-nut operators so a torque of 150 foot-pound (ft.-lb.) or less will operate the valve at the most adverse condition for which the valve is designed. Ensure the vertical axis of the operating nut does not move as the valve is opened or closed.

If the type of valve is not indicated on the plans, use butterfly valves for line valve sizes 24 in. and larger. For valves 24 in. and larger, provide valves manufactured by Pratt, Dezurik, or approved equal. Provide valves from an approved manufacturer. Provide valves and actuators from the same valve or actuator manufacturer. Ensure the shaft connecting the actuator to the valve body is fully enclosed. Provide a fully enclosed, watertight bonnet and extension.

2.11. **Valve Boxes**. Provide Type A cast iron or ductile iron slide-type valve boxes as manufactured by Bass and Hays Foundry, Inc., or approved equal. Ensure the chemical composition of Casting A conforms to AWWA C 110. Fabricate the base of each valve box from 6-in. cast iron pipe or DIP conforming to this Specification, except that the lining and coating must comply with this Section.

Cast a letter “W” into the lid, 1/2 in. in height and raised 3/32 in., for valves serving potable water lines.

Coat boxes, bases, and lids by dipping them in hot bituminous varnish.

2.12. **Fire Hydrants**.

2.12.1. **General**. Provide fire hydrants, including 6-in. gate valve and box, conforming to AWWA C 502, except as modified or supplemented in this Specification, and that are on the utility owner’s approved products list.

Provide fire hydrants in conformance with AWWA C 502, “Standards for Dry Barrel Fire Hydrants.” Provide hydrants that are approved by the City of Houston. Only hydrants with a current certification of responsibility are allowed. The hydrants shown in Table 4 are approved. Alternative hydrants will not be considered.

**Table 4**
**Approved Hydrants**

| Hydrant | City of Houston Engineering Control Drawing |
|---|---|
| U.S. Pipe and Foundry Con. M-94 Metropolitan 5-1/4 in. A495 | DWG 960324 Rev. dated February 6, 2002 |
| Mueller Company Super Construction 250 5-1/4 in. A423 | DWG FH-70 Rev. B dated July 2, 2008 |
| American AVK Company AVK Series 2780 Nostalgic | DWG 2780-Houston-2Rev. AAD3 dated March 24, 2004 |

Ensure they are of dry-barrel, tamper-resistant, and collision-safety construction design. Provide hydrants from same manufacturer throughout the project.

Installation of used, salvaged, or reconditioned fire hydrants is not permitted.

2.12.2. **Hydrant Barrel**. Fabricate the lower hydrant barrel as a ductile iron single piece and connect it to the upper hydrant barrel by joint coupling that provides a 360° rotation of the upper barrel. Clearly mark the finish grade on the barrel. Provide the specified bury length, equal to the distance from the bottom of the inlet to the ground line.

Provide the hydrant barrel with a non-tapped, non-corrodible drain or drip valve, completely made of bronze or bronze-lined. Ensure the drain valve operates, automatically and positively, to drain the barrel when the hydrant valve is in the fully closed position, and to completely close the drain opening to prevent leaking when the hydrant valve is in the open position.

Equip each hydrant barrel with two 2-1/2 in. nominal ID hose nozzles and a single 4-in. nominal ID pumper nozzle conforming to National (American) Standard Fire Hose Coupling Screw Threads, bronze (minimum Grade D) (per NFPA No. 194 and ANSI B 26-1925).

Security-fasten field-replaceable nozzles into the upper barrel by mechanical means, install by turning counterclockwise, seal with O-rings, and mechanically lock in place with a security device. Provide nozzles with nozzle caps and neoprene gasket seals. Securely attach the caps to the hydrant barrel with chains of no less than 1/8-in. diameter. Situate the pumper nozzle to allow an unobstructed radius of 10 in. from the threaded surface of the nozzle throughout the path of travel of a wrench or other device used to fasten a hose to the nozzle.

Orient the hydrant so that the pumper nozzle faces the curb or street closest to the hydrant.

Design the barrel joint connecting the upper and lower hydrant sections so that the hydrant shutoff valve will remain closed and tight against leakage in the event of an impact accident resulting in damage to or breaking of the hydrant above or near ground level. Provide the joint with a breakable bolt flange or breakable coupling, including an adequate number of bolts, above finish grade.

Fabricate the operating and hold-down nuts of stainless steel, cast iron, or ductile iron with bronze inserts. Provide a security device with each hydrant employing a bronze operating nut to protect this feature of the hydrant from malicious mischief or unauthorized removal. Ensure that such security devices do not require special tools for normal off-on operation of the hydrant. For the operating nut, use a tapered pentagon with 1-1/2 in. point to face at the base, and 1-1/8 in. point to face at the top of the nut, opening left (counterclockwise). Fabricate hold-down assemblies of metallic materials suitable for the intended service.

Design the hydrant barrel to permit the use of one or more standard extensions, available from the hydrant manufacturer, in lengths from 6 in.–60 in. in 6-in. increments.

2.12.3. **Shutoff Valve and Inlet Shoe**. Provide hydrants with circular, compression-type shutoff valves that close with the water pressure, with center stem construction, and that remain closed and tight against leakage upon impact. Ensure each shutoff valve is circular and no less than 5-1/4 in. in diameter. Seal the bottom end of the stem threads from contact with water using a cap nut. Provide a bronze valve seat ring, threaded into a bronze drain ring, to provide an all-bronze drainway. Ensure the seat ring and main valve assembly are removable from above ground through the upper barrel using a lightweight seat removal wrench.

Construct the valve seat facing of molded rubber with a durometer rating of 90 ±5, with a minimum thickness of 1/2 in., and that is resistant to microbiological attack.

Unless otherwise shown on the plans, provide a hydrant inlet shoe that is an elbow with the AWWA standard bell designed for a nominal 6-in. mechanical joint hub end, or push-on assembly, as specified. Provide a hydrant shoe of cast iron pipe or DIP that is flanged, swivel, or slip joint with harnessing lugs for restrained joints. Coat the interior of the shoe with at least 12 mils of fusion-bonded epoxy conforming to NSF 61. For underground flanging, incorporate at least six 3/4-in. diameter electro-galvanized or cadmium-coated steel bolts or four 5/8-in. diameter stainless or cadmium-coated steel bolts.

2.12.4. **Valve Stem**. Where threads are in the barrel or waterway, use Everdure operating stems, or other high-quality, non-correctible metal.

Use bronze-to-bronze working parts in the waterway and genuine wrought iron or steel where threads are not located in the barrel or waterway, bronze-bushed at the penetration of the stuffing box. Seal the threads against contact with water regardless of the position (open or closed) of the main valve. Provide the valve stem with a breakable stem coupling opposite the barrel breakaway feature. Construct connecting pins and locking devices of bronze or other corrosion-resistant material. Provide the valve stem with a bronze sleeve, O-ring seals, and a travel stop. Ensure the operating threads, working parts, and bearing surfaces are fully lubricated during normal operation of the fire hydrant. Ensure the lubricant is contained in a lubricating reservoir that is sealed at the top and bottom. Equip the operating assembly with a thrust bearing or lubricated thrust collar to minimize operating torque. Provide a lubricant meeting Food and Drug Administration (FDA) 21 CFR § 178.3570 and manufactured with FDA-approved oxidation inhibitors.

Provide a valve stem that operates counterclockwise (turning to the left) to open.

2.12.5. **Gaskets and Seals**. Provide dynamic seals of O-ring type, oil-resistant material, that do not require adjustment for a watertight seal. Provide moving parts in contact with the seal made of bronze or other corrosion-resistant material.

Provide static seals of Buna-N or other approved synthetic composition.

2.12.6. **Painting**. Shop-coat the fire hydrant's exterior with one coat of rust-prohibitive primer. Ensure the top half of the hydrant from the traffic flange up receives one coat of blue enamel before delivery to the jobsite as outlined by the following.

2.12.6.1. **Exterior Above Traffic Flange (Including Bolts and Nuts)**. Prepare the surface in accordance with SSPC-SP 10 (NACE 2), near-white blast-cleaned surface.

Coat with a three-coat alkyd-silicone-alkyd system with a total DFT of 6 mils–9 mils as follows.

- **Prime Coat**. Oil Modified Alkyd Primer, Acro Products No. 1104, Heavy Duty Tank & Steel Primer, or approved equal, in general accordance with SSPC Paint Specification No. 25. Apply with a total DFT of 2 mils–3 mils.
- **Intermediate Coat**. Heavy Duty Industrial Alkyd Enamel, Acro Products No. 2214, or approved equal, in general accordance with SSPC Paint Specification No. 104, and Federal Standard TT-E-489. Apply with a total DFT of 2 mils–3 mils.

- **Finish Coat**. Silicone Alkyd Resin Enamel, Acro Products No. 2215, or approved equal, in general accordance with SSPC Paint Specification No. 21. Total DFT of 2 mils–3 mils, but do not finish-shop coat the hydrant bonnet, only intermediate-coat it. Field-apply and color-code the finish coating when installed.
- **Colors**. For primer, use the manufacturer's standard color. For the finish coat of the hydrant body, use blue (Acro 555 crystal blue or equivalent). Finish-coat the hose connection caps white, and paint a white band of finish coat 2 in. in width on the hydrant body approximately 6 in. above and parallel to the traffic flange. For intermediate coat, use a contrasting color to the blue finish coat, such as white.

2.12.6.2. **Exterior Below Traffic Flange**. Prepare the surface in accordance with SSPC-SP 10 (NACE 2), near-white blast-cleaned surface.

Coat with a three-coat system as follows.

- **Primer and Intermediate Coat**. Coal-tar epoxy, Acro Products No. 4467, or approved equal, in general accordance with SSPC Paint Specification No. 16. Apply two coats with a DFT of 8 mils–10 mils each, for a total DFT of 16 mils–20 mils.
- **Finish Coat**. Water-based vinyl acrylic mastic, Acro Products No. 7782, or approved equal. Apply one coat with a DFT of 6 mils–8 mils. For the color of the finish coat, use the same as for the finish coat for the exterior above the traffic flange (i.e., blue [Acro 555 crystal blue or equivalent]).

2.12.6.3. **Interior Surfaces Above and Below Main Valve**. Provide material used for internal coating of hydrant interior ferrous surfaces below the main valve that is NSF-61 listed as suitable for contact with potable water, as required by TCEQ, Chapter 290, "Rules and Regulation for Public Water Systems."

Prepare the surface in accordance with SSPC-SP 10 (NACE 2), near-white blast-cleaned surface.

Provide a liquid or powder epoxy system coating in accordance with AWWA C 550. Apply the coating in two or three coats, according to the manufacturer's recommendations, for a total DFT of 12 mils–18 mils.

2.12.6.4. **General**. Apply coatings in strict conformance with the manufacturer's recommendation. No requirement of this Specification cancels or supersedes the written directions and recommendations of the specific coating manufacturer to jeopardize the integrity of the applied system.

Ensure the hydrant supplier furnishes an affidavit of compliance that the materials and work furnished comply with this Specification and referenced applicable standards.

After installing the hydrants and before the main is accepted, paint the bonnet portion of each fire hydrant as shown in Table 5.

**Table 5**
**Fire Hydrant Bonnet Colors**

| Size of Supply Line (in.) | Color of Bonnet |
|---|---|
| 6 | Yellow |
| 8 | White |
| 10–20 | Green |
| 24 and larger | Orange |

Ensure the color shades and paint quantities are approved and comply with the Specifications.

2.12.7. **Performance Standards**. Provide hydrants capable of a free discharge of 1,500 gal. per minute (gpm) or greater, from a single pumper nozzle at a hydrant inlet static pressure not exceeding 20 psig as measured at or corrected to the hydrant inlet at its centerline elevation.

Provide hydrants capable of a discharge of 1,500 gpm or greater from a single pumper nozzle at a maximum permissible head loss of 8.0 psig (when corrected for inlet and outlet velocity head) for an inlet operating pressure not exceeding 37 psig as measured at or corrected to the hydrant inlet at its centerline elevation.

2.12.7.1. **Hydraulic Performance Testing**. In accordance with AWWA C 502, ensure the certified pressure loss and quantity of flow test is conducted by a qualified testing laboratory on a production model (5-ft. bury length) of the hydrant (same catalog number) proposed for certification. Submit a certified test report containing the date of test, within the previous 5 yr., on a fire hydrant with similar hydraulic characteristics, and name, catalog number, place of manufacture, and date of production of hydrants tested.

Provide schematic drawing of testing apparatus, containing dimensions of piping elements, including:

- diameter and length of inlet piping;
- distance from flow measuring points to pressure measurement point;
- distance from flow and pressure monitoring points to the hydrant inlet;
- distance from pressure monitoring point to nozzles;
- diameter and length of discharge tubing; and
- elevation of points of measurement, inlet, and outlet.

Provide reports or certificates documenting the accuracy of the measuring devices used in testing.

Conduct the tests on at least three hydrants of the same fabrication design. Inlet water temperature must be 70°F ±5°F.

For traffic impact testing, submit a certified test report outlining the results of the traffic impact test involving standard production models of the fire hydrant with breakable barrels of the same design as that proposed for certification. Install these hydrants per AWWA C 600. Strike at a point 18 in. ±2 in. above the designated ground line. Conduct tests using the point of impact on hydrant barrel within 2 in. of a line perpendicular to base and equidistant from the pumper nozzle and one hose nozzle.

Conduct successive tests simulating impacts by standard American-made vehicles with gross weights of 3,500 lb., 5,500 lb., and 10,500 lb.

Document the tests to provide the following minimum information.

- Detailed schematic drawings of the test facility
- Complete description of the mechanical impact testing equipment used
- Complete list of the hydrant parts and materials damaged in each impact test
- Photographs
- Size and static pressure of the line to which the hydrant is attached
- Estimated amount of water discharged, if any, from the hydrant within 30 min. immediately following the collision

2.12.8. **Hydrant Leads**. Provide hydrant branch leads conforming to the same requirements under Section 2.2.3., “Steel Pipe Fittings”; Section 2.3., “Ductile Iron Pipe (DIP) and Fittings”; or Section 2.4., “Polyvinyl Chloride (PVC) Pipe and Fittings.”

2.13. **Polyethylene Film Wrap**.

2.13.1. **General**. Except where noted on the plans, use polyethylene film as a wrap to protect cast iron pipe, DIP, and fittings. Provide polyethylene film conforming to this Specification and use only in open-cut construction.

2.13.2. **Film**. Provide polyethylene film in accordance with ASTM 1248 and AWWA C 105, Type 1, Class C, Category 5, Grade J-3, 2.5%–3% carbon black content. Unless otherwise shown on the plans, provide film

8 mils thick with a minimum tensile strength of 1,200 psi–2,500 psi, elongation up to 600%, and in either tubular or sheet form. Furnish film supplied in tubular form in the minimum widths shown in Table 6.

**Table 6**
**Minimum Width of Film Tube (When Lying Flat)**

| Nominal Pipe Size (in.) | Push-On Joint Flat Tube Width (in.) |
|---|---|
| 4 | 14 |
| 6 | 17 |
| 8 | 21 |
| 10 | 25 |
| 12 | 29 |
| 14 | 33 |
| 16 | 37 |
| 18 | 41 |
| 20 | 45 |
| 24 | 53 |

For film in sheet form, furnish in widths equal to twice those shown for tubes.

2.13.3. **Polyethylene Tape**. For taping film edges and overlays, use 3-in. wide plastic-backed adhesive tape. Use Polyken No. 900, Scotch Wrap No. 50, or approved equal.

2.14. **Bedding Material**. Unless otherwise shown on the plans, provide one of the following types of bedding for water mains.

2.14.1. **Bank Run Sand**. Furnish bank run sand bedding as called for in these Specifications and consisting of soil classified as SP, SW, or SM by the Unified Soil Classification System (USCS). Provide sand with a plasticity index, when tested, of less than 7% and a liquid limit of 25 or less. Ensure the bank run sand gradation has a maximum 15% passing the No. 200 sieve when tested, and is free of roots, organic material, trash, clay lumps, or other deleterious or objectionable material.

2.14.2. **Concrete Sand**. Furnish concrete sand bedding conforming to the specifications for Fine Aggregates in ASTM C33. Provide Fine Aggregates consisting of natural sand, manufactured sand, or a combination of the two, within the gradation limits shown in Table 7.

**Table 7**
**Fine Aggregate Gradation**

| Sieve Size | Passing (%) |
|---|---|
| 3/8 in. | 100 |
| No. 4 | 95–100 |
| No. 8 | 80–100 |
| No. 16 | 50–85 |
| No. 30 | 25–60 |
| No. 50 | 10–30 |
| No. 100 | 2–10 |

Ensure the aggregates do not contain any roots, organic material, trash, clay lumps, or other deleterious or other objectionable materials, more than the limits prescribed in ASTM C33.

2.14.3. **Pea Gravel**. Furnish pea gravel bedding conforming to the specifications for Coarse Aggregates specified for No. 8 size in ASTM C33. Provide Coarse Aggregates consisting of gravel comprising small, smooth, rounded stones or pebbles, within the gradation limits shown in Table 8.

**Table 8**
**Coarse Aggregate Gradation**

| Sieve Size | Passing (%) |
|---|---|
| 1/2 in. | 100 |
| 3/8 in. | 85–100 |
| No. 4 | 10–30 |
| No. 8 | 0–10 |
| No. 16 | 0–5 |

Ensure the aggregates do not contain any roots, organic material, trash, clay lumps, or other deleterious or other objectionable materials, more than the limits prescribed in ASTM C33.

2.14.4. **Gem Sand**. Furnish gem sand conforming to specifications for Coarse Aggregates specified for No. 8 size in ASTM C33. Specifically, provide aggregates within the gradation limits shown in Table 9.

**Table 9**
**Gem Sand Gradation**

| Sieve Size | Passing (%) |
|---|---|
| 3/8 in. | 95–100 |
| 1/4 in. | 60–80 |
| No. 4 | 15–40 |
| No. 10 | 0–5 |

Ensure the aggregates do not contain any roots, organic material, trash, clay lumps, or other deleterious or other objectionable materials, more than the limits prescribed in ASTM C33.

2.15. **Backfill Material**. For sand backfill encasement of water mains, use one of the following materials, unless otherwise shown on the plans.

2.15.1. **Cement-Stabilized Sand**. Furnish cement-stabilized backfill containing at least 5% cement per cubic yard of material placed, based on the dry weight of the aggregate in accordance with Tex-120-E. Provide materials consisting of aggregate, cement, and water. Use cement and water conforming to the material requirements of Item 421. Provide sand aggregate, free of deleterious matter, with a plasticity index no greater than 6 when tested by Tex-106-E.

2.15.2. **Earth or Native Soil**. Furnish earth or native soil backfill consisting of soil containing no deleterious material such as trash, wood fragments, or organic or other objectionable material. Supply the material from either the material removed from the excavation or offsite sources.

The material may consist of soil classified by the USCS as ML, CH, CL, CL-ML, SC, SP, SM, SW, or GC. Use earth backfill that meets the compaction requirements in this Specification and does not cause any settlement.

2.15.3. **Bank Run Sand**. Furnish bank run sand backfill as called for in these Specifications and conforming to the same requirements as those under Section 2.14.1., “Bank Run Sand.”

2.16. **Concrete**. Use Class A concrete in conformance with Item 421, unless otherwise shown on the plans. Leave the forms in place unless directed to remove certain sections of the forms.

2.17. **Water Meters, Meter Vaults, and Meter Boxes**.

2.17.1. **Water Meters**. Provide meters of the type and size indicated on the plans.

2.17.1.1. **Bolted Split Casings**. Provide main casings of meters and external fasteners: copper alloy with minimum 75% copper for 5/8 in.–2 in., bronze or cast iron, hot-dip galvanized or epoxy coating for coating for 3 in. and larger.

2.17.1.2. **Straightening Vanes**. Use noncorrosive material compatible with the case material.

2.17.1.3. **Intermediate Gear Train**. Do not allow the intermediate gear train to contact water. Operate in suitable lubricant.

Use automatic meter-reading (AMR) type register that provides pulse, contact closure, piezo switch, or encoder-generated output signal, compatible with utility owner's radio and telephone AMR systems. Provide a minimum 12 ft. of wire when permanently connected to the register. Lens must be impact-resistant. Register box must be tamper-resistant by tamper screw or plug. Register must be permanently sealed, straight-reading, center-sweep test hand, magnetic-driven, reading in U.S. gallons. Six digits are required and must be black, with the lowest registering three digits (below 1,000-gal. registration) in contrasting digit and background colors. Register capacity of meters must be 9.99 million gal. for 5/8 in.–2 in. and 999.999 million gal. for 3 in. and larger.

Connections must be threads at each end for 5/8 in.–1 in., two-bolt oval flanges at each end for 1-1/2 in. to 2 in., and flange at each end for 3 in. and larger.

Stamp the manufacturer's meter serial number on the outer case. Stamp the manufacturer's meter serial number on the outside of the register lid, when provided. Ensure the manufacturer's serial numbers are individual and not duplicated.

Equip compound and turbine meters with AMR-type register to connect to the utility owner's AMR system, manufactured by Badger, Hersey Products, Neptune, Sensus, or approved equal.

Provide fire service meters manufactured by Hersey Products, Neptune, Sensus, or approved equal. Provide displacement meters manufactured by Badger, Neptune, Hersey, Kent, Sensus, or approved equal.

2.17.1.4. **Manufacturing QC**. Permit successful interchangeability from one meter to another of same size, registers, measuring chambers and units, discs or pistons as units, change gears, bolts, nuts, and washers, without affecting the accuracy of the new meters.

2.17.1.5. **Commercial Meter Valves for Meter Installations**. Provide commercial meter valves identical to line valves, but provide them with Class 125 flanges and equip them with hand wheels operating counterclockwise to open.

For pipe and fittings inside the meter box or meter vault, use ductile iron conforming to Section 2.3., "Ductile Iron Pipe (DIP) and Fittings," and as specified on the plans.

2.17.2. **Meter Vaults**.

2.17.2.1. **General**. Furnish meter vaults of precast concrete vault, cast-in-place concrete vault, or solid masonry design, unless a specific type of construction is required on plans. Ensure dimensions and reinforcement comply with the utility owner's standard meter vault drawings for the type and size shown on the plans. Use Class S concrete conforming to Item 421.

2.17.2.2. **Precast Concrete Vaults**. Construct precast concrete vaults as shown on the plans. Use reinforcing steel conforming to Item 440.

Install precast vaults in conformance with the manufacturer recommendations. Set level and on a minimum 3-in. thick bed of sand conforming to Section 2.15., "Backfill Material." Seal lifting holes with cement mortar or nonshrink grout.

2.17.2.3. **Meter Vault Floor Slab**. Slope the floor 1/4 in. per foot toward the sump. Make the sump 12 in. in diameter, or 12 in. square, and 4 in. deep, unless other dimensions are shown on the plans. Install dowels at a maximum 18 in., center-to-center, or install a mortar trench for keying the walls to the floor slab.

2.17.2.4. **Cast-in-Place Concrete Vaults**. Construct cast-in-place concrete vaults as shown on the plans. Use reinforcing steel conforming to Item 440. Key the walls to the floor slab.

2.17.2.5. **Frame and Cover**. Use A-36 welded steel or approved equal. Fabricate the cover plate with a 1/4-in. skid-resistant raised pattern floor plate. Fabricate the meter access door from the same material as the cover plate. Perform welding in accordance with Item 441. Nondestructive testing is not required.

Furnish castings for frames, grates, rings, and covers conforming to ASTM A48, Class 30. Provide locking covers if indicated on the plans. Use castings capable of withstanding the application of an AASHTO HS-20 loading, unless otherwise specified.

Provide covers and frames conforming to the shape dimensions and with the wording or logos shown on the plans. The standard diameter dimension for manhole covers is 32 in. Furnish frames, grates, rings, and covers conforming to Item 471, but as noted above and except for measurement and payment.

2.17.3. **Meter Boxes**.

2.17.3.1. **General**. Furnish meter boxes for 5/8-in.–1-in. meters of the following materials.

- **Nontraffic-Bearing Locations**. Cast iron, concrete, or plastic as specified on the plans.
- **Traffic-Bearing Locations**. Cast iron.

Meter boxes for 1-1/2 in. and 2-in. meters must be cast iron. Provide meter box lids with a key-operated, spring-type locking device and a reading lid. Ensure the lids contain enough metals so that the meter box is easily located with a metal detector. If words are specified on the plans, cast them into lid with letters 1/2 in. high and raised 3/32 in. Ensure the size reads 5/8 in.–1 in. or 1-1/2 in.–2 in.

Furnish meter boxes conforming to the following approximate dimensions.

- **Length**. At the top 15-1/2 in. and at the bottom 20 in.
- **Width**. At the top 12-1/2 in. and at the bottom 14-3/4 in.
- **Height**. 12 in.

Ensure that meter box extensions 3 in. and 6 in. in height are available from the manufacturer.

2.17.3.2. **Cast Iron Meter Boxes**. Furnish cast iron boxes that are clean and free of sand blowholes or other defects and that conform to ASTM A48. Machine the bearing surfaces so that the covers seat evenly in the frames. Provide boxes and lids with a dipped, coal-tar pitch, varnish finish. Provide lock-type meter boxes when shown on the plans. Ensure the lock mechanisms work with ease.

2.17.3.3. **Concrete Meter Boxes**. Furnish concrete meter boxes made of Class A concrete conforming to Item 421. Construct boxes as shown on the plans. Furnish castings that are free of fractures, large or deep cracks, blisters or surface roughness, or any other defects that may affect serviceability.

2.17.3.4. **Plastic Meter Boxes**. Furnish plastic meter boxes made of high-density polyethylene conforming to the ASTM specifications shown in Table 10.

**Table 10**
**ASTM Test Requirements for Plastic Meter Boxes**

| Test | Requirement |
|---|---|
| D256 | Impact Strength = 1.9 ft.-lb./in. (Izod, Notched) |
| D256 | Impact Strength = 6.4 ft.-lb./in. (Izod, Un-Notched) |
| D638 | Tensile Strength (2.0 Min) = 3,400 psi |
| D648 | Deflection Temperature = 170°F |
| D790 | Flexural Modulus = 90,000 psi |
| D2240 | Shore D Hardness, 55–65 Impact Strength, Falling Dart Method, 100 in.-lb. |

Provide meter boxes meeting the following test requirements.

- **Static Load**. No less than 2,500 lb. using a 6-in. disc with direct compression exerted at the center of the top of the meter box with a solid plastic lid.
- **Deflection**. No less than 1,000-lb. load required to deflect the top edge of the meter ox 1/8 in.

Provide a meter box body, without lid, weighing approximately 7 lb.

2.18. **Affidavit of Compliance**. Unless otherwise directed, furnish a manufacturer's affidavit of compliance for each of the materials used in this project. Ensure the affidavit certifies that factory inspection and specified tests were performed and that the material furnished complies with this Specification.

2.19. **Pressure-Reducing Station**. Unless otherwise shown on the plans, furnish new and unused station piping, valves, and fittings, of the same type as specified on the plans.

Use Class S concrete in conformance with Item 421.

Provide reinforcing steel in conformance with Item 440.

Provide a pressure-reducing valve (PRV) with a strainer, in the location and arrangement shown on the plans. Provide a valve body made of ductile iron with ANSI B 16.1, Class 150, flanges. Provide a valve cover made of ASTM A48 cast iron. Use Buna-N rubber parts. No leather parts are allowed. Provide a resilient seat with a rectangular cross-section.

Provide a single moving disc and diaphragm assembly for valve internals. Use a flexible nylon fabric-reinforced elastomer diaphragm integral with assembly. Provide valve internal trim (seat ring, disc guide, and cover bearing) made of stainless steel. Apply a heat-fusion bonded epoxy coating to the internal and external surfaces of the valve body, including the disc retainer and diaphragm washer. Holiday-test the coating applied to the valve body to confirm a minimum even coating of 5 mils–7 mils. Treat the stem using a penetrative salt nitride process. Use a Xylan-coated seat. Leather parts are not allowed. Prepare threaded connections by first using an approved pipe tape.

Furnish control tubing containing shutoff cocks with a "Y" strainer. Equip the valve to allow installing control tubing on either side of the valve. Equip the valve with a valve position indicator.

Ensure the valve and valve box are initially set in the field by an authorized manufacturer's representative. Set the downstream pressure at 60 psi unless otherwise specified. Ensure the PRV includes an adjustable and pressure-sustaining pilot system. Use a diaphragm-type or piston-type valve for the main valve.

Provide Cla-Val Model 90-01BDSYKCKD, Watts ACV Model 115-3M, or approved equal.

Provide a basket strainer upstream of the PRV as shown on the plans. Furnish a quick-opening type strainer body of fabricated steel construction with ANSI, Class 150, flanges. Use Type 304 stainless steel for the basket.

Provide a Hayward Model 90, or equal, for PRVs 4 in.–24 in. When there are space constraints, provide a Hayward Model 510, or equal, for PRVs 14 in. or greater.

2.20. **Adjusting Manholes**. Reuse removed manhole and inlet rings, plates, grates, covers, and brick if they are in good condition as determined by the Engineer. Provide additional materials in accordance with Item 465 at no cost to the Department. Single- or multiple-piece prefabricated metal extension rings may be used for the adjustment of manholes as approved. Provide concrete that conforms to Item 421.

## 3. CONSTRUCTION

All construction must conform to this Special Specification, the plans, and the following Items.

- Item 100, “Preparing Right of Way”
- Item 400, “Excavation and Backfill for Structures”
- Item 402, “Trench Excavation Protection”
- Item 403, “Temporary Special Shoring”
- Item 421, “Hydraulic Cement Concrete”
- Item 465, “Junction Boxes, Manholes, and Inlets”
- Item 476, “Jacking, Boring, or Tunneling Pipe or Box”
- Item 479, “Adjusting Manholes and Inlets”

3.1. **Excavation**.

3.1.1. **Trenches**. Construct water lines and fire hydrant branches (leads) in open-cut trenches with vertical sides, except in those locations where the pipe is tunneled, cased, or augered. Construct the trenches to the dimensions shown in the excavation and backfill details.

Sheath and brace the trenches to the extent necessary to maintain the sides of the trench in a vertical position throughout the construction period. Protect excavation greater than 5 ft. in depth as specified by Item 402 or Item 403.

Open and excavate the trenches to the finished grade. To allow for adjustment of the alignment and grade, locate the water mains to which the mains and fire hydrant branches (leads) under construction will be connected, well in advance of making connections.

Construct water mains and fire hydrant branches (leads) in dry trenches. If necessary, employ well pointing or additional sheathing to accomplish this objective, at no additional cost to the Department.

For pipes less than 18 in. in diameter, the minimum trench width below the top of the pipe is the OD of the pipe plus 18 in. For pipes 18 in. and larger, the minimum trench width below the top of pipe is the OD of pipe plus 24 in. Additional width is required for unstable conditions. The Engineer will determine unstable conditions.

Where it is necessary to excavate trenches adjacent to improved property, take precautions to avoid damaging or impairing that property. Where it is necessary to disturb property features such as grass, shrubs, and driveways, restore such improvements to their original condition.

Use enough trench width or benches above the embedment zone when installing well point headers or manifolds and pumps, where the trench depth makes it uneconomical or impractical to pump from the surface elevation. Provide enough space between the shoring cross-braces to permit equipment operations and handling the forms, pipe, embedment and backfill, and other materials.

Before moving the supports, place and compact the embedment to enough depth to provide protection of the pipe and stability of the trench walls. As the supports are moved, finish placing and compacted the embedment.

Immediately before placing the embedment materials, ensure the bottoms and sidewalls of trenches are free of loose, sloughing, caving, or otherwise unsuitable soil.

Place and compact the embedment materials directly against the undisturbed soils in the trench sidewalls or against sheeting that will remain in place.

Do not place trench shields or shoring within the height of the embedment zone unless using some means to maintain the density of the compacted embedment material. If using moveable supports in embedment zone, lift the supports incrementally to allow placing and compacting of the material against undisturbed soil.

Place haunching material around the pipe and compact it to provide uniform bearing and side support.

Place trench dams in Class I embedments near the midpoint of line segments longer than 100 ft. between manholes.

Where damage to the completed pipe installation work is likely to result from withdrawal of the sheeting, leave the sheeting in place.

3.1.2. **Existing Streets**. Unless otherwise shown on the plans, open-cut existing streets.

Where water line construction requires cutting through existing streets outside the limits of new street construction, replace those streets in kind in conformance with the appropriate Specifications in the proposal or as directed. When cutting pavement outside the Department's right of way, comply with the utility owner street-cutting ordinance.

Where in the opinion of the Engineer it is necessary to maintain traffic across a trench, construct temporary bridges as necessary to facilitate the movement of traffic.

At locations where the proposed water main parallels the edge of an existing permanent pavement (e.g., concrete pavement and concrete base with asphalt surface) and is 3 ft. or less from the edge of that pavement, protect the trench with timber sheathing and bracing. Leave the bracing in place at intervals of 5 ft. maximum.

Keep the street surface adjacent to the trench free of surplus spoil. Place construction materials at locations that minimize interference with the traveling public.

Do not close more than two street intersections at any one time unless authorized in writing.

3.2. **Jacking, Tunneling, Boring, or Augering**.

3.2.1. **General**. Perform jacking, tunneling, or augering for water mains and fire hydrant branches (leads) at the locations shown on the plans and at other locations specifically designated by the Engineer.

Unless otherwise shown on the plans, use casing pipe conforming to Section 2.2.2., "Steel Casing Pipe."

Excavate auger pits to a finished grade at least 6 in. lower than that indicated by the construction stakes or as approved, to ensure that a dry pit bottom is encountered.

Provide a minimum width of jacking, tunneling, or augering pits such that there is at least 6 in. of space between the pipe and the walls of the auger pit. The maximum allowable width of the pit is 5 ft., unless otherwise approved. Ensure the width of the pit at the surface is not less than at the bottom. The maximum allowable length of the pit is 5 ft. longer than one full joint of pipe of the type being used and does not exceed 25 ft., unless approved.

Grout in place tunnels for water lines with 36-in. diameters. When casing size is 48 in. in diameter or greater, or when using a tunnel liner plate, regardless of the water line diameter, grout in place unless otherwise directed. Provide an annular grout consisting of a sand-cement mortar mix with a 28-day compressive strength of at least 1,500 psi, when tested in accordance with ASTM C942. The maximum allowable density is 130 pcf.

Use admixtures meeting ASTM C494 and ASTM C1017 as required, to improve pump ability, control the time of set, hold sand in suspension, and reduce segregation and bleeding. Fill the annular space in three lifts to prevent pipe floating. In addition, place appropriate blocking between the carrier pipe and the top of the liner to maintain position. Place a concrete invert to facilitate threading the carrier pipe.

Do not allow inadvertent metallic contact between the casing and the carrier pipe. Place spacers to ensure that the carrier pipe is adequately supported throughout its length, particularly at ends, to offset setting and possible electrical shorting, unless otherwise approved. Ensure the end spacer is within 6 in. of the end of the casing pipe, regardless of the size of the casing and carrier pipe or the type of spacer used. Casing spacers are designed to withstand much greater loads than can be safely applied to most coatings. Therefore, the spacing between spacers depends largely on the load-bearing capabilities of the pipe coating and the flexibility of the pipe.

Install casing spacers in conformance with the manufacturer's instructions. Use particular care to ensure that subcomponents are correctly assembled and evenly tightened, and that no damage occurs while tightening the insulators or inserting the carrier pipe.

Seal the annulus between the carrier pipe and casing with casing end seals at each end of the casing.

Insular spacing Specifications are as follows.

- Provide spacing as shown on the plans with a maximum distance between spacers of 10 ft. for pipe sizes 4 in.–14 in. and 8 ft. for pipe sizes 16 in.–30 in.
- For DIP, flanged pipe, or bell-and-spigot pipe, install spacers within 1 ft. on each side of the bell or flange, and one in the center of the joint when 18-ft.–20-ft. long joints are used.
- If the casing or carrier pipe is angled or bent, reduce the spacing. Provide the casing with a smooth, continuous interior surface.

Perform bedding and backfilling of jacking, tunneling, boring, or augering pits in conformance with the plans and these Specifications.

3.2.2. **Jacking Steel Casing**. Perform jacking of steel casing in accordance with Item 476.

3.2.3. **Tunneling**. Perform tunneling in accordance with the tunneling requirements of Item 476.

3.2.4. **Boring or Augering**. Perform boring or augering in accordance with Item 476.

Do not exceed 100 ft. for the length of the auger hole without a receiving pit.

Do not exceed 75 ft. for the length of the auger hole for PVC pipe 12 in. and less in diameter without a receiving pit.

Do not exceed 40 ft. for the length of the auger hole for PVC pipe 16 in. and greater in diameter without a receiving pit.

At locations where water pipes cross underneath driveways (of 16 ft. or less in width) or sidewalks, install the pipe in tight-fitting augered holes.

At locations where the centerline of the proposed water main is 10 ft. or less from the centerline of an 8-in. diameter or larger growing tree, place the pipe in a tight-fitting augered hole. Extend the bored hole at least 4 ft. beyond each side of the tree.

Block the void space around the pipe in the augered hole with approximately 12 in. of packed clay or similar approved material, so that the bedding or backfill does not escape into the void around the pipe in the auger hole when compacted.

Around the pipe, use the minimum volume of the clay or similar acceptable material as shown in Table 11.

**Table 11**
**Volume of Clay or Acceptable Material for Blocking Voids**

| Pipe Diameter (in.) | Minimum Quantity (cu. ft.) |
|---|---|
| 4–8 | 0.5 |
| 12–16 | 0.75 |

3.2.5. **Bedding for Trenches and for Jacking, Tunneling, Boring, or Augering Pits**.

3.2.5.1. **Pipe Bedding for Water Mains Less than 24 in. in Diameter**.

3.2.5.1.1. **Open-Cut Trench Installation**. Construct trenches with at least 6 in. of bedding. Remove the soil in the bottom of the trench, excavate to a minimum depth of 6 in. below the bottom of the pipe, and replace the soil with bedding material. Remove saturated material from the bottom of the pit before placing the bedding. Place the pipe in the bedding such that there is 6 in. of bedding below and up to the spring line of the pipe.

Compact the bedding material to within 95% of the standard density within 5% of the optimum moisture as determined by Tex-113-E. Mechanically compact the bedding material using vibratory equipment or any other acceptable equipment.

3.2.5.1.2. **Jacking, Tunneling, Boring, or Augering Pits**. Construct pits with at least 6 in. of bedding. Remove the soil in the pit, excavate to a minimum depth of 6 in. below the bottom of the pipe, and replace the soil with bedding material.

If the bottom of the excavation becomes wet due to the presence of groundwater and a dewatering system is not required, and if directed, overexcavate an additional 6 in. to a depth of 1 ft. below the bottom of the pipe. Place a nonwoven geotextile fabric and then compact 12 in. of bank run sand or concrete sand in a single lift on top of the fabric. Compact the upper 6 in. to 90% of the standard maximum density as determined by Tex-113-E. The Engineer may require the Contractor to remove unstable or unsuitable material even if the Contractor does not determine the material to be unsuitable.

Mechanically compact the bedding material using vibratory equipment or any other acceptable equipment. Compact the bedding material to 95% of the standard density within 5% of the optimum moisture, as determined by Tex-113-E.

3.2.5.1.3. **Bedding Materials**. The following describes the acceptable materials for bedding.

- Section 2.14.1., “Bank Run Sand”
- Section 2.14.3., “Pea Gravel”

Bank run sand may be used as bedding material around the pipe only if, as determined by the Engineer, the trench bottom and sides are dry. If sand is used, place the pipe in the bedding so that there is at least 6 in. of bedding around and on top of the pipe. Compact the sand as described in Section 3.2.5.1.1., “Open-Cut Trench Installation.”

3.2.5.2. **Pipe Bedding for Water Mains 24 in. or Greater in Diameter**. For open-cut, provide pipe bedding as described in Section 3.2.5.1., “Pipe Bedding for Water Mains Less than 24 in. in Diameter,” but use bank run sand for the bedding material as described in Section 2.14., “Bedding Material.”

Compact cement-stabilized sand used as backfill or as pipe bedding as specified on the plans, in 6-in. lifts to 95% of the standard maximum density as determined by Tex-113-E, at the optimum moisture content.

3.3. **Handling Pipe and Accessories**. During pipe construction operations, use caution to prevent damage to the pipe, protective linings, and coatings in conformance with the manufacturer’s recommendations. Do not place debris, tools, or other materials in the pipe.

Repair any damage to the pipe or the protective lining and coating from any cause during the installation of the pipeline and before final acceptance by the purchaser. Perform this work as directed, in conformance with the applicable standards, and at no cost to the Department.

Unload pipe, fittings, valves, and accessories at the point of delivery and haul them to the project site. Distribute the material opposite or close to the place where it will be laid in the trench such that stormwater or runoff will not enter or pass through the pipe. Do not drop the materials. Do not allow pipe handled on skidways to be skidded or rolled against pipe already on the ground.

Load, transport, unload, and otherwise handle pipe and fittings in a manner and by methods that prevent damage of any kind. Handle and transport pipe using equipment designed, constructed, and arranged to prevent damage to the pipe, lining, and coating. Do not allow bare chains, hooks, metal bars, or narrow skids or cradles to contact the coatings. Provide pipe fittings with enough interior strutting or cross-bracing to prevent deflection under their own weight.

Hoist the pipe and fittings from the trench side into the trench using a sling of smooth steel cable, canvas, leather, nylon, or similar material. Do not lift pipe using hooks at each end of the pipe. When stacking pipe, ensure it is packaged on timbers. Place protective pads under the banding straps at the time of packaging.

When using fork trucks to relocate pipe, pad the forks using carpet or some other suitable type of material. When relocating pipe using a crane or backhoe, use nylon straps or smooth steel cable. Do not use chains around the pipe for lift.

3.4. **Cutting Pipe**. Cut pipe 12 in. in diameter and smaller in conformance with the manufacturer's recommendations. Cut pipe larger than 12 in. in an approved manner. Perform each cut at right angles to the axis of the pipe and file or grind to remove sharp edges. Use a cutting machine unless otherwise approved. Do not damage pipe or linings and coatings while cutting.

3.5. **Defective or Damaged Material**. Inspect pipe and accessories for defects before lowering into the trench. Repair or replace any defective, damaged, or unsound material as directed.

If a damaged piece of pipe, furnished by the Contractor, is placed in the water main, furnish the labor and materials necessary to remove and replace the defective pipe and to restore the street to its original condition at no cost to the Department. If the Contractor damages the pipe after installation, the Engineer may permit the damaged section to be cut from the length, unless it is the opinion of the Engineer that the entire length was damaged. The cost and replacement of broken pipe are at the expense of the Contractor.

3.6. **Cleaning Pipe and Accessories**. Remove lumps, blisters, and excess coating from the bell-and-spigot ends of steel pipe, DIP, valves, hydrants, and fittings. Wire-brush the outside of the spigot and the inside of the bell and wipe clean, dry, and free of oil and grease before laying the pipe.

Remove foreign matter or dirt from the interior of water pipe, accessories, and the mating surfaces of the joints, before lowering the material into the trench. Keep the pipe and accessories clean during and after laying using approved means.

Use chemicals such as cleaning solutions, detergents, and solvents with caution when cleaning PVC pipe.

Provide cleanup and restoration crews to work closely behind the pipe-laying crews and, where necessary, during disinfection, testing, service transfers, abandonment of old mains, backfilling, and surface restoration.

Upon completely installing a section not exceeding 4,000 ft. per crew, immediately prepare to disinfect and pressure-test between valves or plugs. No later than 3 days after completing disinfection preparatory work, submit to the utility owner an appropriate request for disinfection.

Begin transfer of services no later than 7 calendar days after successfully completing the disinfection and pressure-testing.

Immediately after transfer of services, begin abandonment of the old mains, including resodding and placing sidewalks and pavements.

Do not begin construction of additional sections if the above conditions are not met.

For large-diameter water mains, do not install more than 2,000 ft. of main, until the previous 2,000 ft. is cleaned up and the site is fully restored. Schedule paving crews so that the repaving work will not lag behind the pipe-laying work by more than 1,000 ft.

Completely restore the site within 30 days from the date the water main is disinfected and hydrostatically tested, unless extended in writing by the Engineer.

For projects involving multiple locations, limit water main installation to at most two project site locations.

Remove construction debris or foreign material and thoroughly clean and flush piping systems as approved. Provide temporary connections, equipment, and labor for cleaning. The Engineer will inspect the water main for cleanliness before filling.

To disinfect of water lines, conform to Section 3.17., "Disinfecting Mains and Testing for Leakage."

3.7. **Laying Pipe**. For pipe-laying, employ only workers who are skilled and experienced in laying pipe of the type and joint configuration being furnished. Provide watertight pipe and pipe joints. Lay pipe with the bell ends facing in the direction of laying, unless otherwise directed.

Lay pipe to the lines and grades shown on the plans. To ensure proper placement, use adequate surveying methods and equipment, and employ personnel competent in using this equipment. Ensure the pipe does not deviate from the horizontal and vertical alignment indicated on the plans by more than 0.10 ft., without prior approval. Measure and record the as-built horizontal alignment and vertical grade at most every 50 ft. on the onsite recorded plans.

During pipe-laying operations, keep pipe trenches free of water that might impair the laying operations. Ensure holes for bells are of ample size to prevent the bells from contacting the subgrade. Carefully grade pipe trenches to provide uniform support along the bottom of the pipe.

Do not lay more than 50 ft. of pipe in the trench ahead of the backfilling operations. If pipe-laying operations are interrupted overnight, cover the pipe laid in the trench simultaneously on each side of the pipe or completely backfill, to avoid lateral displacement of the pipe and damage to the joints. If adjustment of the position of a length of pipe is required after it is laid, remove and re-lay it in conformance with these Specifications and at no expense to the Department. After pipe-laying and joining operations are complete, clean the inside of the pipe and remove debris.

Use care to prevent damage to the coating when placing backfill. Backfill in accordance with Section 3.11., "Backfilling."

Lay pipe in a straight line unless otherwise shown or approved. Long-radius curves, either horizontal or vertical, may be laid with standard pipe using deflections at the joints. If curved pipe is shown, needing no special fittings, the curves may be made by deflection of the joints with standard lengths of pipe as approved. If maximum pipe joint deflections are permitted, do not exceed the manufacturer's recommendation for maximum pipe joint deflections. Joint the gasketed pipe in a straight alignment, and then deflect it to the curved alignment.

If the vertical deflection exceeds the maximum recommended by the manufacturer, remove the entire portion of the deflected pipe section and install new pipe as directed. Perform this work at no expense to the Department. The Engineer may measure assessment of deflection at any location along the pipe. Arithmetical averages of the vertical deflection or similar average measurement methods are not deemed as meeting the intent of the standard.

Where field conditions require horizontal deflection curves not shown on the plans, the Engineer will determine the methods to be used.

No additional payment will be made for laying pipe on curves as shown, or for change orders involving standard lengths of pipe deflected at the joints. Adjust the pipe, valves, hydrants, and fittings to be at their proper locations and prepare each joint as specified in Section 3.8., "Joining Pipe and Accessories." As each joint of pipe is laid in the trench, center the spigot end in the bell of the previously laid pipe, then force home the pipe and bring it to the correct line and grade. Ensure each length of pipe rests on the bottom of the trench and is inspected for damage throughout its entire length.

When pipe-laying is discontinued for the day or for an indefinite period, tightly place a cap or plug in the end of the last pipe laid to prevent intrusion of water. When water is excluded from the interior of pipe, place enough backfill on the pipe to prevent floating. Schedule the work to prevent the possibility of flotation. Remove from the trench any pipe that has floated and re-lay as directed.

When assembling PVC pipe on top of the trench, allow it to cool to ground temperature before backfilling, to prevent pullout due to thermal contraction.

Do not schedule night work or plant shutdown to begin within 2 working days before or after utility-owner designated holidays.

For tie-ins to existing water mains, provide the necessary material on hand to facilitate connection before shutting down the existing water main.

Ensure that separation from gravity sanitary sewers and manholes, or from force mains, is at least 9 ft. of clearance in all directions or as specified, unless a special design is shown on the plans.

Minimum clearance of this Specification is as follows.

- **Parallel Water Line and Gravity Sanitary Sewer Force Main, or Manhole with No Leaks**. Minimum 4-ft. horizontal clearance from the outside wall of the water line to the outside wall of the gravity sanitary sewer, force main, or manhole.
- **Water Line Crossing Above Gravity Sanitary Sewer or Force Main with No Leaks**. Minimum 2-ft. vertical clearance.
- **Water Line Crossing Below a Sanitary Sewer or Force Main with No Leaks**. Minimum 2-ft. vertical clearance.

3.8. **Joining Pipe and Accessories**.

3.8.1. **DIP, Valves, Hydrants, and Fittings**. After thoroughly cleaning the inside of the bell and the outside of the spigot, install members in conformance with the manufacturer's recommendation and AWWA C 600, or as modified by these Specifications.

Mark pipe and accessories that are not furnished with a depth mark before assembly to ensure that the spigot end is inserted to the full depth of the joint.

Brace the fittings on small mains with short pieces of 2-in. galvanized pipe as directed.

Brace each plug installed under this Contract by a standard pipe clamp, a 3-ft. nipple of the same diameter pipe as the nearby sections of mains, and a block of concrete.

For 4-in.–12-in. water mains, use pipe clamps that are UL-approved for underground water service piping. For water mains 16 in. and larger, use pipe clamps conforming to the plans.

For rubber-gasketed joints, use lubrication that is water-soluble, nontoxic, nonobjectionable in taste and odor imparted to the fluid, and nonsupporting of bacteria growth, and that has no deteriorating effect on coatings or rubber gaskets.

3.8.2. **PVC Pipe and Accessories**. Join plastic pipe in conformance with the instructions furnished by the manufacturer. To prevent weakening the joint, do not handle or install in the trench pipe joined using solvent-cementing techniques until the joints cure.

For rubber-gasketed joints, use lubrication that is water-soluble, nontoxic, nonobjectionable in taste and odor imparted to the fluid, and nonsupporting of bacteria growth, and that has no deteriorating effect on PVC or rubber gaskets.

3.8.3. **Welded Joints for Steel Pipe**. Ensure the joints receive a full-penetration butt-weld type double weld, in accordance with AWWA C 206. It is the Contractor's option to use either automatic or hand welders. Before starting the work, provide proof of certification of qualification for welders employed on the project for every type of work procedure and position involved. Ensure qualification is in accordance with AWWA C 206. Ensure complete penetration of deposited metal with the base metal. Provide inside fittings and joints that are free of globules of weld metal that would restrict flow or become loose.

Miter end cuts of both ends of butt-welded joints may be used for joint deflections up to 2.5°.

Set fittings and joints square and true, and preserve the alignment during welding operations. Align the butting ends to minimize the offset between surfaces. For pipe of the same nominal wall thickness, do not exceed 1/16-in. offset. Use lineup clamps for this purpose; however, exercise caution to avoid damaging to the linings and coatings.

Furnish each welder employed with a steel stencil for marking welds, so the work of each welder can be identified. Mark pipe with the assigned stencil adjacent to the weld. If a welder leaves the job, void that stencil and do not duplicate it. Welders making defective welds must discontinue work and leave the project site. Such welders may return to the project site only after recertification.

During welding, protect the lining by draping an 18-in. wide strip of heat-resistant material over the top half of the pipe on each side of the lining holdback to avoid damage to the lining by the hot splatter. Protect the tape coating similarly.

Provide welding rods of a type compatible with the metal being welded, to obtain the strongest bond, E-70XX.

Deposit the metal in successive layers so there will be at least two passes or beads for automatic welding and three passes or beads for manual welding in the completed weld.

On welds, do not deposit more than 1/4 in. of metal on each pass. Thoroughly clean the weld by wire-brushing and hammering on each pass, including the final one, to remove dirt, slag, or flux.

Do not perform welding under any weather condition that would impair the strength of the weld, such as wet surface, rain or snow, dust, or high winds, unless the work is properly protected.

If using tack welds, ensure they are of the same material and made by the same procedure as the completed weld. Otherwise, remove tack welds during the welding operation.

Remove dirt, scale, and other foreign matter from the inside of piping before tying in sections, fittings, or valves.

Provide a minimum overlap of 4 in. of butt strap over the adjacent piece on butt strap closures.

Employ an approved independent certified testing laboratory to perform weld tests and associated work to accommodate testing on the entire job. Include the cost of such testing in the Contract unit bid price for the water main. Furnish copies of test reports to the Engineer for review. Ensure testing is by X-ray methods for butt welds and is performed for every joint weld. If a defective weld is revealed, assume the cost of repairing and retesting the repaired weld. The Engineer has the full and final decision regarding the suitability of welds tested. If any interior or exterior coating or lining is damaged during the welding process, repair it and return it to its original state as approved, in conformance with applicable AWWA standards.

Provide cylindrical corrosion barriers (CCBs) for epoxy-lined steel pipe smaller than 24 in. in diameter. Furnish CCBs manufactured by CCB International, Inc., or approved equal. CCBs are not required if the minimum wall thickness is 1/2 in. or greater.

In addition to the welding requirements contained in this Specification, conform to the protection fitting manufacturer's installation recommendations.

Provide the services of a technical representative of the manufacturer available onsite at beginning of pipe-laying operations. Ensure this representative can train welders and advise regarding installation and general construction methods. Employ only welders with at least 12 mo. of experience in installing protection fittings.

3.8.4. **Flanged Joints for Steel Pipe**. Before installing bolts, accurately center the flange joints and align them to prevent mechanical prestressing of flanges, pipe, and appurtenances. Align bolt holes to straddle the vertical, horizontal, or north-south centerline. The maximum inclination of the flange face from the true alignment is 3/64 in. per foot.

Use full-face gaskets for flanged joints. Provide 1/8-in. thick cloth-inserted rubber gasket material. Cut the gaskets at the factory to the proper dimensions.

Unless otherwise noted, provide insulation kits at connections to the existing water system or at locations to isolate one type of cathodic system from another type; between water line, access manhole piping, and other major openings in the water line; or as shown on the plans.

For isolating flange joints 30 in. in diameter and greater, and at butterfly valve flanges, provide a Pyrox G-10 with nitrite seal, Type E LineBacker gasket as manufactured by Pipeline Seal and Insulator, Inc., or approved equal, conforming to ANSI A 21.11 mechanical joint gaskets. For isolating flange joints 24 in. in diameter and smaller, provide a Phenolic PSI with nitrite seal, Type E LineBacker gasket as manufactured by Pipeline Seal and Insulator, Inc., or approved equal, conforming to ANSI A 21.11 mechanical joint gaskets.

Use galvanized or black nuts and bolts to match the flange material. Use cadmium-plated steel nuts and bolts under ground. Tighten the bolts progressively to prevent unbalanced stress. Consistently maintain approximately same distance between the two flanges at all points around the flanges. Tighten the bolts alternately (180° apart) until they are evenly tight. Draw the bolts right to ensure properly seating the gaskets. Provide Denso, or approved equal, petroleum-based tape-wrapping system for nuts and bolts.

Pay particular attention to procedures used in tightening and torquing flanged joints. Improper methods may result in leakage and require corrective measures. Follow recommended industry standards and guidelines as set forth by the various fabricators and manufacturers.

3.8.5. **Flanged Joints for Use on DIP**. See Section 3.8.4., "Flanged Joints for Steel Pipe."

3.9. **Thrust Restraint.** Provide adequate temporary blocking of fittings when making connections to the distribution system and during hydrostatic tests. Provide enough anchorage and blocking to resist stresses and forces encountered while tapping the existing water line. For new water lines 16 in. in diameter and larger, provide restraining joints as specified in this Section. Provide restrained joint lengths as shown on the plans or as directed. For existing water lines and water lines less than 16 in. in diameter, restrain pipe joints with concrete thrust blocks or provide joints as specified in this Section.

The length of the restrained joints shown on the plans assumes that hydrostatic testing will begin upstream and proceed downstream with respect to the normal flow of the water in the pipe. If installation or testing of the pipe differs from this assumption, submit for approval a revised method of restraining the pipe joints upstream and downstream of the device used to test against (i.e., block valve, blind flange, or dished head plug).

3.10. **Electrical Continuity Bonds**.

3.10.1. **General**. Attach the bond wires at the required locations using the Thermite welding process.

3.10.2. **Thermite Welding Methods**. Perform Thermite welding of bond wires to the piping in the following manner.

Ensure the pipe to which the wires will be attached is clean and dry. Use a grinding wheel to remove coating, mill scale, oxide, grease, and dirt from an area approximately 3 in. square. Grind the surface to bright metal.

Remove approximately 1 in. of insulation from each end of the wires to be Thermite-welded to the structure, exposing clean, oxide-free copper for welding.

Select the proper size Thermite weld mold as recommended by the manufacturer. Place the wire between the graphite mold and the prepared metal surface. For No. 12 AWG size wires, use a copper sleeve crimped over the wire. Place the metal disk in the bottom of the mold. Place the Thermite weld charge in the mold. Squeeze the bottom of the cartridge to spread ignition powder over the charge.

Close the mold cover and ignite the starting powder using a flint gun. After the exothermic reaction, remove the Thermite weld mold and gently strike the weld with a hammer to remove the weld slag. Pull on the wire to assure a secure connection. If the weld is not secure or the wire breaks, repeat the procedure with a new wire. If the weld is secure, coat bare metal and weld metal with a coal-tar compound. If a polyurethane dielectric coating has been used, use a compatible polyurethane coating.

3.11. **Backfilling**.

3.11.1. **General**. Backfill trenches in accordance with Item 400.

Begin backfilling and cleaning up each section of main (i.e., from valve to valve) immediately upon completing the hydrostatic test, unless otherwise permitted by Engineer, and continue until obtaining a final and complete cleanup of the section. Any portion of the trench that is left open more than that required to facilitate hydrostatic testing may be ordered closed by the Engineer.

Use surplus excavated materials in the embankments, or dispose of them as directed.

3.11.2. **Backfilling Pipe for Water Mains**.

3.11.2.1. **Open Cut**. After the pipe joints are made up and inspected, backfill the trenches with excavated materials or any other backfill material covered by this Specification, as approved. Backfill the portion from the spring line of the pipe (or from 6 in. on top of pipe if sand bedding is used) to the top of the trench in maximum lifts of 9-in. loose measurement (provided the trench is not located in areas used for automobile or pedestrian traffic, such as sidewalks, roadways, roadway shoulders, and driveways). Mechanically compact the backfill material using vibratory equipment, or any other acceptable equipment, so that no settlement occurs.

Compact to a density of at least 95% of the maximum dry density, as determined in accordance with Tex-114-E. The Engineer reserves the right to perform compaction tests on an as-needed basis. Compaction by water tamping is prohibited.

Do not allow dirt, clods, or trench sides to fall or rest against the pipe before completing the embedment or backfill.

The allowable materials for backfill are listed in Section 2.15., "Backfill Material."

Continue backfilling and compacting in this manner to the minimum elevation shown in the excavation and backfill diagram.

3.11.2.2. **Boring or Augering Pits**. Backfill boring or augering pits with bank run sand up to 1 ft. from the top of the natural ground. For the final 12 in., use backfill consisting of 10 in. of native soil in the bottom and 2 in. of bank run sand just below the grass.

Backfill the portion from the spring line of the pipe to the top of the pit in lifts not exceeding 9 in. (loose measurement). Mechanically compact the backfill using vibratory equipment, or any other acceptable equipment, so that no settlement occurs. Compact the material to a density of at least 95% of the maximum dry density at optimum moisture content as determined in accordance with Tex-113-E or Tex-114-E. The utility owner may perform compaction tests on an as-needed basis. Compaction by water tamping is prohibited.

Do not allow dirt, clods, or auger pit sides to fall or rest against the pipe before completing the embedment or backfill.

The only allowable material for backfill in boring or augering pits is bank run sand, described in Section 2.15., "Backfill Material."

3.12. **Valves and Fire Hydrants**. Ensure each valve and fire hydrant is completely closed when placed in the pipeline.

Install valves and hydrants in accordance with AWWA C 600, except where modified by this Specification. Provide drainage at the base of the hydrant in accordance with AWWA C 600.

Set each hydrant at the location and grade indicated by the stakes, and plumb, brace, and install in accordance with AWWA's requirements for fire hydrant installation. If the barrel of a hydrant is to pass through a concrete slab, fit a piece of 1-in. thick preformed bituminous expansion joint material closely around the section of the barrel passing through the concrete.

Locate the nozzle centerline at least 18 in. above the finish grade.

Place 12-in. × 12-in. yellow indicators (plastic, sheet metal, plywood, or other approved material) on pumper nozzles of new or relocated fire hydrants installed on new mains not in service. Remove indicators after the new main is tested and approved.

3.13. **Tapping Sleeves and Valves**.

3.13.1. **General**. Install tapping sleeves and valves at the locations and using the sizes shown on the plans. Thoroughly clean the tapping sleeve, tapping valve, and pipe in conformance with the manufacturer's instructions before installing.

Hydrostatically test the installed tapping sleeve to 150 psig for at least 15 min. Inspect the sleeve for leaks, and remedy any leaks before the tapping operation.

When tapping concrete pressure pipe, size-on-size, use a shell cutter one standard size smaller than that of the water line being tapped. Do not use LEB increases with a next-size tap except for existing asbestos-cement (AC) pipe.

3.13.2. **Installation**. Verify the OD of the pipe to be tapped before ordering the sleeve. Tighten the bolts in the proper sequence to avoid placing undue stress on the pipe. Align the tapping valve properly and attach it to the tapping sleeve. Insert the insulation sleeve into the flange holes of the tapping valve and pipe. Insert the sleeve on pipe side of tapping valve. Do not damage insulation sleeves during the bolt-tightening process.

Make the tap using a sharp shell cutter. For 12-in. and smaller taps, use a minimum cutter diameter 1/2 in. less than the nominal tap size. For 16-in. and larger taps, use the manufacturer's recommended cutter diameter.

Withdraw the coupon and flush the cuttings from the newly made tap. For 12-in. and smaller taps, wrap the completed tapping sleeve and valve in accordance with this Specification.

For 16-in. and larger taps, apply Denso or approved equal petroleum-based tape-wrapping system around the completed tapping sleeve and valve. Place the concrete thrust block behind the tapping sleeve (not over the tapping sleeve and valve).

Arrange for the mandatory inspection of the installation before backfilling. Completion of the inspection is not required before backfilling. Backfill in accordance with this Specification and as shown on the plans.

If AC pipe is encountered, follow the safety practice outlined in the Asbestos-Cement Pipe Producers Association publication *Recommended Work Practices for A/C Pipe*, and address the encounter as a Mandatory Practice for this project.

3.14. **Boxes for Valves**. Cut the cast iron pipe or DIP to the proper length. Then assemble and brace the box as approved. Construct manholes over the operators of butterfly valves for sizes 30 in. and larger.

For concrete for valve box placement, at locations in new concrete pavement, use the same strength and mix design as those of new pavement. For other locations, use Class A concrete, conforming to Item 421.

Install valve box and riser piping plumbed in a vertical position. Provide 6-in. telescoping freeboard space between the riser pipe top butt end and the interior contact flange of the valve box, for vertical movement damping. Ensure the riser (bell end of pipe) rests on the valve flange. or provide a suitable foot piece to support the riser pipe.

Set, align, and adjust the valve box so that the lid is level with the final grade.

Paint the covers of new valve boxes fluorescent orange when installed. After completion and approval, repaint the covers black.

3.15. **Wet Connections**. Make the wet connections, as directed, in such a manner and at such hours to minimize inconvenience to the public. When the existing mains are cut or a plug removed for a connection, pursue the work of making the connection without interruption until complete.

If the Contractor proceeds with a wet connection without a complete shutoff, there will be no extra compensation for damages or extra work resulting from the incomplete shutoff.

The utility owner will operate gate valves in the existing system and in sections of completed mains that have been placed in service. Notify the utility owner at least 48 hr. before making connections.

Wet connections that are 2 in. or smaller are sometimes referred to on the plans as 2-in. standard connections or gooseneck connections.

Items that may be necessary to complete these types of wet connections include corporation cock, saddle, copper tubing, brass fittings, and 2-in. valves. Do not use these connections on or consider them as part of a 2-in. service line.

The utility owner will undertake, at no cost to the Contractor, operations involving opening and closing valves for wet connections.

3.16. **Polyethylene Film Wrap**. Except as noted on the plans, wrap DIP (including fittings and other appurtenances) with a polyethylene film. Also wrap fire hydrant barrels.

Remove lumps of clay, mud, and cinders on the pipe surface before installing the polyethylene encasement. Prevent soil or embedment material from becoming trapped between the pipe and the polyethylene. Fit the polyethylene film to the contour of the pipe to achieve a snug, but not tight, fit. Encase with minimum space between the polyethylene and the pipe. Provide enough slack in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Secure overlaps and ends with adhesive tape to hold polyethylene encasement in place until backfilling operations are complete.

For installations below the water table and in areas subject to tidal actions, seal both ends of the polyethylene tube with adhesive tape at the joint overlap.

Repair any cuts, tears, punctures, or damage to the polyethylene with adhesive tape or with a short length of polyethylene sheet or cut open tube, wrapped around the pipe to cover the damaged area, and secured in place.

Provide openings in encasement for branches, service taps, blowoffs, air valves, and similar appurtenances by making an “X”-shaped cut in the polyethylene and temporarily folding back the film. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut, as well as other damaged areas in the polyethylene, with tape. Service taps may also be made directly through the polyethylene. Repair any resulting damaged areas as described above.

For junctions between wrapped and unwrapped pipe, where polyethylene-wrapped pipe joins an adjacent pipe that is not wrapped, extend polyethylene wrap to cover the adjacent pipe for at least 3 ft. Secure the end with circumferential turns of tape. Wrap service lines of dissimilar metals with polyethylene or suitable dielectric tape for a minimum clear distance of 3 ft. away from cast iron pipe or DIP.

3.16.1. **Tubular-Type Wrap**. When the polyethylene film is supplied in tubular form, install it on the pipe before placing the pipe in the trench and in the following manner.

Elevate the spigot end of the pipe, brush mud and debris from the pipe, and slip a length of film (approximately 2 ft. longer than the joint of pipe) over the joint of the pipe. Wrap the film tightly around the spigot end, leaving approximately 1 ft. extending beyond the end of the pipe, and tape the edge down lightly with polyethylene tape.

When lifting the joint of pipe for placing in the trench, remove any remaining mud, clay, or debris. Insert the spigot end into the bell end of the joint previously placed, push home, and release the pipe into the trench. Pick up the pipe joint at the bell, slide the film to a point in back of the bell, and prepare a bell hole.

When laying the next joint, pull the film beyond the bell to overlap the film attached to the spigot of the new pipe joint. Wrap the film by folding it longitudinally and tape it securely in place to prevent damage during backfill. Do not tape the end that is slipped over the last bell, but bind it with twine or other approved material.

At each corporation, draw the loose material up around the corporation base and seal it with tape to insulate the two dissimilar metals.

Wrap fittings and fire hydrant leads, and tape or bind the wrap with heavy twine. Wrap fittings, such as bends and reducers, similarly to the method outlined above. Wrap specials, such as valves, tees, and crosses, by splitting, tucking, and overlapping the polyethylene tube, then closing the field-made splices with the required tape. Material to cover the valves may be acquired from excess overlapping polyethylene tubing on adjacent pipe joints. Draw the polyethylene tubing over the bell of the pipe on either side and insulate with field-made seams as described above. Completely wrap fittings and specials that require concrete blocking before placing concrete.

3.16.2. **Sheet-Type Wrap**. Apply sheet-type wrap around the pipe either before or after positioning the pipe in the trench. Install above ground in a manner like that described for tubular installation in Section 3.16.1., "Tubular-Type Rap." Install in trench in a manner like that described below.

Cut the polyethylene sheet to a length approximately 2 ft. longer than the pipe section. Center the length to provide a 1-ft. overlap on each adjacent pipe section, bunching it until it clears the pipe ends. Wrap the polyethylene around the pipe so that it circumferentially overlaps the top quadrant of the pipe. Secure the cut edge of the polyethylene sheet at intervals of approximately 3 ft.

Lower the wrapped pipe into the trench and make up the pipe joint with the preceding section of pipe. Make shallow bell holes at joints to facilitate installation of the polyethylene. After completing the joint, make the overlap and secure the ends.

Repair cuts, tears, punctures, or other damage to the polyethylene. Proceed with installing the next section of pipe in the same manner.

3.16.3. **Boring or Augering Section Installation**. Use cast iron pipe or DIP with a polyurethane coating as specified herein.

Provide a final seal against the intrusion of the backfill material by completely encasing the tapping sleeve with sheet vinyl of 8-mil thickness. Apply tape to secure this wrapping, using Polyken No. 900, Scotch Wrap No. 50, or approved equal, manufactured for this purpose.

3.17. **Disinfecting Mains and Testing for Leakage**.

3.17.1. **Disinfecting Mains**. The utility owner will furnish water for disinfecting and flushing without charge to the Contractor.

Furnish the necessary taps, risers, and jumpers of such sizes and materials as specified by the Engineer and install the subject material in the locations designated. Normally, each valve section of main requires two 3/4-in. taps; however, on larger mains, the Engineer may order that 1-1/2 in. or 2-in. taps and risers be used.

Furnish and install the necessary temporary blind flanges, sleeves, and plugs as required to disinfect and pressure-test the new mains.

Use fire hydrants as blowoffs to flush newly constructed water lines 8 in. in diameter and more.

After laying and backfilling the pipe, disinfect the newly laid pipe. Unless otherwise shown on the plans, the utility owner will furnish and pay for the labor and materials necessary for the initial application of the disinfecting agent. Slowly fill each valve section of pipe with water and expel the air from the pipe. Furnish and install taps at the points of highest elevation, if required to accomplish this. After filling the main with water and expelling the air, charge the pipe with the disinfecting agent and allow it to stand for 24 hr. Unless otherwise shown on the plans, the utility owner will then flush the main with water. After flushing, draw samples from the main and test for 2 consecutive days at a valid, approved testing facility. After samples are drawn and the test results pass, proceed with the pressure test and any necessary repairs. If the samples do not pass, re-disinfect the pipe until the samples taken are passed by the certified and approved testing facility. Unless otherwise shown on the plans, if more than one disinfection of the main (or portion of the

main) is required, the additional disinfection will be charged to the Contractor at rates established by the utility owner.

After disinfecting and flushing water lines, bacteriological tests will be performed by the utility owner or testing laboratory.

When test results indicate a need for additional disinfection of water lines based on Texas Department of Health requirements, assist utility owner with additional disinfection operations.

3.17.2. **Testing for Leakage**. Following the first disinfection test, subject the newly laid pipes to a hydrostatic pressure of 125 psi, unless otherwise shown on the plans. Where practicable, test pipelines in lengths between line valves or plugs, of at most 1,500 ft., unless otherwise approved. Perform the pressure test using a pump connected to the pipe in a manner satisfactory to the Engineer. Furnish, install, and operate the necessary connections, pump, meter, and gauges. Before running the pressure test, ensure the meter is tested; sealed; and approved (at the Contractor's expense) by an approved, certified testing facility. Ensure the minimum duration of the test is 8 hr. If a large quantity of water is required to maintain pressure during the test, discontinue testing until the cause of the water loss is identified and corrected.

Observe the following general regulations during each leakage test for cast iron pipe, DIP, and PVC pipe.

Except for welded steel pipe in which no leakage is permitted, ensure that pipelines, when subjected to the specified pressure test, do not show leakage of more than 3.19 gal. per inch of diameter, per mile, in 24 hr.

Repair portions of the pipe showing visible leaks regardless of the total leakage shown by the pressure test. Remove and replace cracked or defective pipes, fittings, valves, or hydrants discovered by this pressure test with sound material. If the main is opened for any reason, re-disinfect it until satisfactory samples are obtained. Also, pressure-test it until this Specification is met.

Immediately upon completing disinfection and pressure-testing, remove all taps, risers, and blowoffs. Then backfill the remainder of the trench in accordance with this Specification.

Perform leakage testing at no additional cost to the Department.

3.18. **Using Completed Sections of Mains**. The utility owner may use and operate portions of the water mains that are disinfected and pass the leakage test. Unless otherwise shown on the plans, operate the valves in such completed sections only with the express permission of the utility owner.

The use of the mains is not construed as acceptance of them and does not relieve the Contractor's responsibility for fulfilling the conditions of the Contract, unless the mains are damaged due to negligence on the part of the utility owner.

3.19. **Lowering Mains**. When lowering a main, perform the initial excavation in such a manner to permit the mains to rest on several dirt benches. If soil conditions are unsatisfactory for dirt benches, use wooden blocks to support the mains. Then attach the pipe by using ropes, cable, or chains to overhead supports; remove the dirt benches or wooden blocks; and slowly and evenly lower the pipe into position. After lowering the mains, repair each damaged joint as directed.

3.20. **Copper Service Line Construction**. The use of Hays-Seal and Mueller Company catalog numbers to describe various fittings is not intended to be proprietary, but merely to indicate clearly the respective types of fittings to be furnished.

3.20.1. **Installing Service Lines**. For curb and gutter streets, lay copper service lines with a minimum 30 in. of cover from top of curb to the top of the service line. For crowned streets with open ditches, lay copper service lines with a minimum 30 in. of cover at the crown and with a minimum 18 in. of cover from the flow line of the ditch

to the top of the service line. Ensure service line locations are clear of proposed paving and underground work.

Exercise caution to always keep the lines free of dirt and foreign matter. Assemble copper lines in an entirely slack position and free of kinks. Use service lines consisting of one continuous run of copper tubing where possible. Do not use bends greater than that originally found in the coil of tubing as packaged.

For 1-1/2 in. and 2-in. copper tubing shipped in straight lengths, use the following bend criteria.

For 2-in. copper tubing, at most one 45° bend may be accomplished in a 4-ft. section, and for 1-1/2 in. copper tubing, one 45° bend in a 3-ft. section. No kinks, dents, flats, or crimps are permitted.

Locate meters, in general, 1 ft. into the street right of way. Where this is not applicable, locate meters approximately 1 ft. from the sidewalk on the curb side. If the current meter location conflicts with proposed driveway turnouts or other proposed street improvements, shift the meter to miss the obstruction and reconnect it to the customer's service line. Reset meters at positions such that the top of the meter is 4 in.–6 in. below the finished grade.

Where the plans call for salvaging and relocating the meter, meter box, and curb stop, remove these materials with care, thoroughly clean them, and submit them for inspection by the Engineer, before installing them in the new location. If the plans call for relocating the meter (other than at some point along the existing service line), a new service line is required.

Where it is necessary to cross a paved street, push the service line under the paving through a predrilled and prepared opening. Use only full lengths of copper tubing, taking care not to damage the tubing when pulling it through the prepared hole.

A compression-type union is permitted only when a full 40-ft. (60 ft. for 3/4 in.–1 in.) length of tubing cannot completely span underneath the pavement. Do not use compression-type unions under the paved street.

3.20.2. **Installing Corporation Stops**. Tap the main at a location such that a straight line passing through the meter and the corporation stop will be at 90° to the main. Locate taps in the upper portion of the main within 45° of the pipe spring line. Perform the cutting operation using an approved sharp shell cutter tool.

Install taps for service lines conforming to Table 12. Space taps at least 2 ft. apart.

**Table 12**
**Service Tap Requirements for Service Lines**

| Water Main Type and Diameter | Service Size Diameter | | | |
|---|---|---|---|---|
| | 3/4 in. | 1 in. | 1-1/2 in. | 2 in. |
| 4-in. cast iron or ductile iron | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 4-in. AC | WBSS | WBSS | DSS, WBSS | DSS, WBSS |
| 4-in. PVC (AWWA C 900) | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 6-in. and 8-in. cast iron or ductile iron | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 6-in. and 8-in. AC | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 6-in. and 8-in. cast iron or ductile iron | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 6-in. and 8-in. PVC (AWWA C 900) | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 12-in. cast iron or ductile iron | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 12-in. AC | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 12-in. PVC (AWWA C 900) | DSS, WBSS | DSS, WBSS | DSS, WBSS | DSS, WBSS |
| 16-in. and more cast iron or ductile iron | DWBSS | DWBSS | DWBSS | DWBSS |
| 16-in. and more AC | DWBSS | DWBSS | DWBSS | DWBSS |
| 16-in. and more PVC (AWWA C 900) | DWBSS | DWBSS | DWBSS | DWBSS |

Note—DSS = Dual strap saddles.
DWBSS = Dual wide-band strap saddles.
WBSS = Wide-band strap saddles.

3.20.3. **Installing Curb Stops**. Set curb stops or angle stops only at the outer end of the service line just ahead of the meter. Secure the opening in the curb stop to prevent unwanted material from entering. Use eighth-bend or quarter-bend couplings to accomplish close-quarter turns in the service line.

In 3/4-in. and 1-in. services, install a meter coupling or swivel nut meter spud curb stop, ahead of the meter. Also install a straight meter coupling on the outlet end of the meter. Install a new curb stop when the service line is extended.

3.20.4. **Sequence of Work**. Open the trench for the proposed service line or prepare the jacking and receiving pits.

Install the corporation stop in a workmanlike manner using the proper equipment.

Install the copper service line and connect it to the corporation stop.

Install the curb stop on the meter end of the service line.

With the curb stop open, and before connecting the service line to the meter, open the corporation stop and flush the service line adequately. Close the curb stop, leaving the corporation stop in the fully open position.

Check the service line for apparent leaks. Repair leaks before proceeding.

Connect the service line to the meter and, if necessary, adjust the meter location. Use care to ensure that the inlet side of the meter is connected to the water service line. Momentarily open the curb stop to verify proper registration of the meter.

Backfill the excavations, tamping the backfill material in place to the density of the soil in the adjacent trench walls.

If relocating the meter, relocate the meter box so that it is centered over the meter with the top of the lid flush with the finished grade. When the meter must be in driveways or sidewalks, furnish and install an approved traffic-type meter box with a cast iron lid.

3.21. **Cutting and Plugging Water Mains**. Where the plans call for abandoning water mains, adhere to the following general procedure.

After constructing, disinfecting, testing, and placing the replacement main in service, and services are transferred to the replacement main, locate the main to be abandoned, trace it back to the feeder main, and at this point cut and plug it at the tee. Normally, installing a plug, clamp, and a concrete thrust block accomplishes this. In cases of 1-1/2 in. or 2-in. corporation cock or tapping sleeve and valve connections, remove the valve and install a cap or plug at the tee. Ensure the line to be abandoned is not valves-off at the nearest valve or cut and plugged other than at the supply main.

Adequately plug the ends or openings in abandoned mains or cap them in an approved manner and replace excavation, backfill, and any street surfaces to the Engineer's satisfaction. Perform this work in accordance with Section 3.1., "Excavation," and Section 3.11., "Backfilling."

Remove surface identification (i.e., valve boxes and fire hydrants). Where valve boxes are in improved streets (other than shell), pouring valve boxes full of concrete with the cap permanently removed is permitted.

Do not remove plugs during the months of peak water demands (June, July, and August) unless otherwise approved.

3.22. **Service Lines of Public Utilities**. Where any pipe or conduit of a public utility corporation crosses the water main trench, support such pipe or conduit in a manner satisfactory to the Engineer.

If the Contractor considers it necessary for a utility company to relocate their utility lines or other improvements, notify the Engineer in advance.

If the Engineer considers it imperative to make the change, the Engineer will make the necessary arrangements with the utility company.

3.23. **Relocating Meter Vaults**. Salvage existing valves, meters, and strainers from inside the vault and return them to the utility owner, or as designated on the plans.

Install pipe, valves, service lines, and other appurtenances in accordance with this Specification or as directed.

In general, install the type of meter vault shown on the plans or as approved.

3.23.1. **Precast Concrete Vault**. Construct and furnish the precast concrete vault as shown on the plans.

Set the precast concrete vault level on a minimum 3-in. bed of sand in an excavation and bring it to grade. Then install piping and backfill with sand around the vault.

3.23.2. **Cast-in-Place Concrete Vault**. Construct the cast-in-place concrete vault as shown on the plans. Key the walls to the floor slab and form to the dimensions shown on the plans. Provide a minimum wall thickness of 4 in. Cast the walls monolithically. One cold joint is allowed when the vault depth exceeds 12 ft. Set the frame for the cover while the concrete is still green.

3.23.3. **Frame and Cover**. Construct the frame and cover as shown on the plans.

In grass areas, set the frame and cover 2 in.–3 in. above the natural ground or finished grade and parallel to it (the maximum allowable angle from horizontal is 20°). Slope the backfill away from the meter.

In sidewalk areas, set the frame and cover 1/2 in.–1 in. above the adjacent concrete and parallel to it. Slope the replacement concrete away from the meter to meet the adjacent concrete.

3.23.4. **Inspections**. The following inspections will be made jointly by the Engineer and representatives of the utility owner.

- **Site Location Inspection**. To obtain the required approval of proposed meter location before commencing work.
- **Final Inspection**. Conducted after the backfill is in place, the cover is installed, the cleanup is completed, and the surface is restored.

3.24. **Adjusting Existing Surface Structures**.

3.24.1. **Valve Boxes**. Salvage and reuse the valve box. Remove and replace the 6-in. ductile iron riser pipe with a suitable length for the depth of cover required to establish the adjusted elevation to accommodate the actual finished grade.

Reinstall the valve box and riser piping plumbed in a vertical position. Provide a minimum 6-in. telescoping freeboard space between the riser pipe top butt end and the interior contact flange of the valve box, for vertical movement damping.

After setting, aligning, and adjusting the valve box so that the top lid is level with the final grade, place a 24-in. × 24-in. × 8-in. thick concrete block around the valve box. Center the valve box horizontally within the concrete box.

3.24.2. **Meter Boxes**. Salvage and reuse meter boxes when possible. Reinstall them in conformance with the manufacturer's recommendations. Repair any damage sustained by the meter box during relocation or service transfer at no expense to the Department.

If the existing meter box requires replacement, the Contractor may obtain a new box from the utility owner by providing adequate documentation of the existing and proposed locations.

3.24.3. **Meter Vaults**. Adjust meter vaults in conformance with the details shown on the plans. Salvage and reuse access covers.

3.25. **Relocating Water Meters and Boxes**. Salvage, clean, inspect, and install existing curb stops, meters, unions, and meter boxes at the new locations in conformance with this Section. When the meter and box are relocated, move them the minimum distance to enable access for new connections. Repair any damage sustained by the meter box during relocation or service transfer at no expense to the Department.

If unable to salvage the existing boxes, the Contractor may obtain new boxes from the utility owner by providing proper documentation of the existing and proposed locations of the meter.

When approved, the Contractor may relocate meter boxes located adjacent to existing pavement, if this operation facilitates construction or decreases the costs. Obtain written approval and perform this work, including excavation, piping, meter box relocation, and removal and replacement of paving, at no cost to the Department.

3.26. **Installing Split Casing**. Notify the utility owner at least 48 hr. in advance of any work planned involving existing water lines. Do not, at any one time, expose more than 20 ft. of water lines to be encased.

Place 6-in. × 6-in. × 1-1/4 in. neoprene pads between the split casing sections and the top and bottom of the water lines, spacing them at approximately 6 ft. or as directed.

Ensure the completed and shaped trench to receive the casing is wide enough to provide free working space for satisfactorily installing the casing and backfilling under and around the casing.

Hold the split casing in place for welding using hinges, coupling bands, or any other acceptable method.

Use a casing diameter no less that the outside dimension of the pipe at is longest dimension plus 4 in.

Perform welds conforming to AWWA C 206. Provide welds capable of developing the full strength of the pipe throughout the joint and casing split.

Seal the ends of the encasement pipe with casing and seals in accordance with Section 2.2.1., "Steel Carrier Pipe," to prevent the entrance of excessive groundwater.

3.27. **Modifications for Cathodic Protection**.

3.27.1. **General**. Provide cathodic protection systems as shown on the plans.

References to steel pipe apply to tape-coated welded steel pipe. If damage occurs to the pipe coatings during the welding process, refurbish the affected area to its original condition.

3.27.2. **Bonded Joints**. Where rubber gasket bell and spigots are provided, provide for bonded joints by either welding a strap or clip between the bell and the spigot of each joint, or providing a Thermite-welded cable between the bell and the spigot of each joint. Provide pipes, whether installed in a tunnel or open-cut, with bonded joints, except where providing insulating flanges. Where welding joints for thrust restraint, no additional bonding is required.

Provide a strap or clip, for bonding the bell to the spigot, that is free of foreign material that could increase the contact resistance between the wire and the strap or clip.

Unless otherwise noted, provide insulation kits at connections to the existing water system, at locations to isolate one type of cathodic system from another type, between the water main and extra piping, or as shown on the plans.

3.28. **Removing and Salvaging Fire Hydrants and Water Meters**. Deliver removed and salvaged fire hydrants and water meters to the utility owner at the location shown on the plans, or as directed.

3.29. **Installing the Nonmetallic Pipe Detection System**. Install the nonmetallic pipe detection system concurrently with placing the proposed pipe. Install as specified by the manufacturer and as approved.

3.30. **Removing Water Mains and Removing Water Mains with Casing**. Remove water mains and water mains with casing in accordance with Item 100, or as shown on the plans. This includes removing and disposing of pipe and appurtenances as shown on the plans or as directed. Perform related excavation and backfilling, as required, at no additional cost the Department.

3.31. **Adjusting Manholes**. Perform work in accordance with Item 465. Excavate and backfill in accordance with Item 400. Carefully remove and temporarily store, as directed, manhole and inlet rings, covers, plates, and grates to be reused. Clean mortar and grease from the contact areas of reused items. Dispose of unused removed material as directed. Use construction methods described in Section 479.3.1., "Lowering the Top of a Manhole or Inlet," and Section 479.3.2., "Raising the Top of a Manhole or Inlet," unless otherwise shown on the plans.

3.31.1. **Lowering the Top of a Manhole or Inlet**. Remove a sufficient depth of brick courses or concrete to permit reconstruction on a batter not exceeding 1 in. horizontal to 2 in. vertical. Where brickwork is present, clean the mortar from the top course of brick. Rebuild the manhole or inlet to the original top dimensions or to the dimensions shown on the plans. Install the manhole or inlet ring and the cover, plate, or grate to conform to the proposed new surface contour.

3.31.2. **Raising the Top of a Manhole or Inlet**. Clean the top surface of brick or concrete. Construct to the proper new elevation using new brick, brick salvaged from other manholes or inlets, prefabricated metal extension rings, concrete rings, or Class A concrete. Install the manhole or inlet ring and the cover, plate, or grate to conform to the proposed new surface contour. Install prefabricated extension rings in accordance with manufacturer's instructions.

## 4. MEASUREMENT

4.1. **Water Main Pipe and Steel Casing**. Measured by the foot of the various sizes and types specified. Water mains and casing will be measured along the axis of the pipe, and no deductions will be made for valves or fittings. Reducers will be classed as pipe of the size of the larger end.

Unless otherwise shown on the plans, fire hydrant branches (leads) will be measured by the foot of the various types and installation methods specified, along the axis of each branch (lead) from the hydrant to the end of the branch (lead). No deductions will be made for valves or fittings.

4.2. **Split Steel Casing**. Measured by the foot of the various sizes shown on the plans.

4.3. **FRP Pipe for Casing**. Measured by the foot of the various sizes shown on the plans.

4.4. **Jacking, Tunneling, Boring, or Augering**. Jacking, tunneling, boring, or augering for water mains and steel casing will be measured by the foot of the sizes, types, and wall thickness (applicable only for casing) specified.

Jacking, tunneling, boring, or augering for fire hydrant branches (leads) will be measured by the foot of the various types specified.

4.5. **New Copper Service Lines**. Measured by each service line installed.

Short-side service line refers to service connections made to meters located on the same side of the street as the supply main location. Long-side service line refers to service connections made to meters located on the opposite side of the street from the supply main, or from the center of the street, where the supply main is in the center of the street.

4.6. **Gate Valves, Tapping Sleeves and Valves, and Butterfly Valves**. Measured by each assembly installed of the various sizes specified, except that gate valves 20 in. in diameter and smaller will be included as part of the work to the water lines.

4.7. **Fire Hydrants**. Measured by each assembly installed, including a 6-in. gate valve and box, regardless of depth. It is the Contractor's responsibility to install the fire hydrant assembly such that it meets the standard installation requirements of this Specification and the manufacturer's specifications.

Fire hydrant branches (leads) will be measured as indicated in Section 4.1., "Water Main Pipe and Steel Casing," and Section 4.4., "Jacking, Tunneling, Boring, or Augering."

4.8. **Meters and Vaults**. Measured by each assembly constructed.

4.9. **Air Release and Vacuum Relief Valves**. Measured by each assembly of the various sizes, with the valve box installed.

4.10. **Pressure-Reducing Stations**. Measured by the lump sum unit constructed.

4.11. **Blowoff Valves**. Measured by each assembly of the various sizes and types, with the valve box installed.

4.12. **Removing Fire Hydrants**. Measured by each assembly removed and disposed of properly.

4.13. **Removing Water Valves and Boxes**. Measured by each assembly removed and disposed of properly.

4.14. **Removing and Relocating Meters and Boxes**. Measured by each assembly removed, cleaned, and installed at the new location.

4.15. **Removing Meters and Vaults**. Measured by each assembly removed and disposed of properly.

4.16. **Removing and Salvaging Water Meters**. Measured by each assembly removed and salvaged.

4.17. **Removing and Salvaging Fire Hydrants**. Measured by each assembly removed and salvaged.

4.18. **Removing and Relocating Water Meters and Meter Vaults**. Measured by each assembly removed and relocated.

4.19. **Adjusting Meter Vaults**. Measured by each assembly adjusted.

4.20. **Adjusting Meter Boxes**. Measured by each assembly adjusted.

4.21. **Adjust or Relocate Water Meter**. Measured by each assembly adjusted or relocated.

4.22. **Lowering Water Mains**. Measured by the foot of the sizes and types of pipe lowered.

4.23. **Cutting and Plugging Water Mains**. Measured by each location where a water main is cut and plugged, of the sizes indicated.

4.24. **Removing Pressure-Reducing Stations**. Measured by each complete pressure-reducing station removed.

4.25. **Wet Connections**. Measured by each connection of the sizes specified.

4.26. **Extra Hand Excavation or Extra Machine Excavation**. Measured by the cubic yard in its original position. Excavation performed by manual labor at the locations specifically designated by the Engineer, and that is not included under other bid items contained in this Specification, is considered extra hand excavation or extra machine excavation.

4.27. **Adjusting Manholes**. Adjusted manholes will be measured as each manhole adjusted.

## 5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the items of work described below. These prices are full compensation for furnishing, hauling, placing, and installing the materials; for inspecting and testing; and for other materials, labor, equipment, tools, and incidentals.

5.1. **Water Main Pipe and Steel Casing**. Payment for water main pipe and steel casing will be made at the unit price bid for "Water Main Pipe (Cast-Iron)," "Water Main Pipe (Steel)," "Water Main Pipe (Ductile Iron)," "Water Main Pipe (Copper)," "Water Main Pipe (Polyvinyl Chloride) (PVC)," and "Casing (Steel)" of the various sizes and types specified, installed by the open-cut method.

Unless otherwise shown on the plans or in the Specifications, excavating, disposing of unsuitable excavated material, backfilling, and the material for backfill for the complete installation of the water main system will be subsidiary to this bid item.

5.2. **Split Steel Casing**. Payment for split steel casing will be made at the unit price bid for "Split Steel Casing" of the various sizes specified, installed by the open-cut method.

5.3. **FRP Pipe for Casing**. Payment for FRP pipe for casing will be made at the unit price bid for "Fiberglass Reinforced Plastic (FRP) Pipe for Casing" of the various sizes specified.

5.4. **Jacking, Tunneling, Boring, or Augering**. Payment for jacking, tunneling, boring, or augering water main will be made at the unit price bid for "Jacking, Tunneling, Boring, or Augering (Water Main)" of the sizes and types specified. This price includes furnishing the pipe.

Payment for jacking, tunneling, boring, or augering fire hydrant branches (leads) will be made at the unit price bid for "Jacking, Tunneling, Boring, or Augering Fire Hydrant Branch (Lead) (6 in.)" of the types and installation method specified. This price includes furnishing the pipe.

Payment for jacking, tunneling, boring, or augering steel casing will be made at the unit price bid for "Jacking, Tunneling, Boring, or Augering Casing (Steel)" of the sizes, types, and wall thickness (applicable only if exceeding minimum thickness, shown in Section 2.2.2., "Steel Casing Pipe") specified. This price includes the casing. Water mains and fire hydrant branches (leads) placed in the casing will be paid for under the appropriate bid item.

Excavating; backfilling; backfill material; and disposing of unsuitable excavated material for jacking, tunneling, boring, or augering pits will be subsidiary to these bid items.

5.5. **New Copper Service Lines**. Payment for copper service lines will be made at the unit price bid for "Service Line (Short Side 5/8 in. to 1 in.)," "Service Line (Long Side 5/8 in. to 1 in.)," "Service Line (Short Side 1-1/2 in.

to 2 in.)," and "Service Line (Long Side 1-1/2 in. to 2 in.)" installed. This price is full compensation for labor, materials, excavation, and backfill required to install the facility, including connection to the customer's service line.

5.6. **Gate Valves, Tapping Sleeves and Valves, and Butterfly Valves**. Payment for gate valves (larger than 20 in. in diameter), tapping sleeves and valves, and butterfly valves will be made at the unit price bid for "Gate Valve," "Tapping Sleeve and Valve," and "Butterfly Valve" of the various sizes specified, with the valve box installed.

5.7. **Fire Hydrants**. Payment for fire hydrants will be made at the unit price bid for "Fire Hydrant Assembly," including 6-in. gate valve and box, installed regardless of barrel depth.

Payment for fire hydrant branches (leads) will be made at the unit price bid for "Fire Hydrant Branch (Lead) (6 in.)" installed by the open-cut method.

Any adjustment required either in the flow line of the water main or to the barrel length of the fire hydrant will be subsidiary to this bid item.

5.8. **Meters and Vaults**. Payment for meters and vaults will be made at the unit price bid for "Meter and Vault" constructed.

5.9. **Air Release and Vacuum Relief Valves**. Payment for air release and vacuum relief valves will be made at the unit price bid for "Air Release and Vacuum Relief Valve" of the various sizes specified, with the valve box installed.

5.10. **Pressure-Reducing Stations**. Payment for pressure-reducing stations will be made at the unit price bid for "Pressure Reducing Station." This price is full compensation for performing the necessary excavation, backfill, finish grading, constructing the concrete structure, and furnishing and installing station appurtenances addressed under Article 2., "Materials."

5.11. **Blowoff Valves**. Payment for blowoff valves with boxes will be made at the unit price bid for "Blow Off Valve" of the various sizes and types specified, with the valve box installed.

5.12. **Removing Fire Hydrants**. Payment for removing fire hydrants will be made at the unit price bid for "Removing Fire Hydrant." This price includes removing valves from the existing location, disposing of the valves, and plugging at the tee. Excavation and backfill required for removing fire hydrants will be subsidiary to this bid item.

5.13. **Removing Water Valves and Boxes**. Payment for removing water valves and boxes will be made at the unit price bid for "Removing Water Valve and Box." Excavation and backfill required for removing water valves and boxes will be subsidiary to this bid item.

5.14. **Removing and Relocating Meters and Boxes**. Payment for removing and relocating meters and boxes will be made at the unit price bid for "Removing and Relocating Meter and Box."

5.15. **Removing Meters and Vaults**. Payment for removing meters and vaults will be made at the unit price bid for "Removing Meter and Vault." This includes salvaging the meter strainers and valves and delivering them to their owner at the location shown on the plans or as directed.

5.16. **Removing and Salvaging Water Meters**. Payment for removing and salvaging water meters will be made at the unit price bid for "Removing and Salvaging Water Meter." This price includes removing salvaged water meters from the existing locations and delivering them to the owner. Excavation, backfill, and finish grading required for removing the water meters will be subsidiary to this bid Item.

5.17. **Removing and Salvaging Fire Hydrants**. Payment for removing and salvaging fire hydrants will be made at the unit price bid for "Removing and Salvaging Fire Hydrant." The salvaging of fire hydrants will be a cash reimbursement to the owner by the Contractor where the fire hydrants will become the property of the Contractor or the Contractor will deliver the fire hydrants to the utility owner at the location shown on the plans. Excavation, backfill, and finish grading required for removing fire hydrants will be subsidiary to this bid item.

5.18. **Removing and Relocating Water Meters and Meter Vaults**. Payment for removing and relocating water meters and meter vaults will be made at the unit price bid for "Removing and Relocating Water Meter and Meter Vault."

5.19. **Adjusting Meter Vaults**. Payment for adjusting meter vaults will be made at the unit price bid for "Adjusting Meter Vault." This price is full compensation for furnishing the required materials, including backfill as required; excavation; tools; labor; equipment; and incidentals.

5.20. **Adjusting Meter Boxes**. Payment for adjusting meter boxes will be made at the unit price bid for "Adjusting Meter Box."

5.21. **Adjust or Relocate Water Meter**. Payment for adjusting or relocating water meters will be made at the unit price bid for "Adjusting or Relocating Water Meters." This price is full compensation for adjusting or relocating water meters. Miscellaneous fittings required to complete the work will not be paid for directly, but will be subsidiary to this Item unless otherwise shown on the plans. Water line sterilization and testing of the completed water main system will be subsidiary to this Item.

5.22. **Lowering Water Mains**. Payment for lowering water mains will be made at the unit price bid for "Lowering Water Mains" of the sizes and types of pipe lowered. This price is full compensation for lowering and adjusting pipes, as well as any connected valves, boxes, and service lines. Excavation and backfill required for lowering water mains will be subsidiary to this bid item.

5.23. **Cutting and Plugging Water Mains**. Payment for cutting and plugging water mains will be made at the unit price bid for "Cut and Plug Water Main" of the sizes indicated. This price is full compensation for performing excavation, backfill, finish grading, and other incidental items required to abandon or cut and plug the water main as set forth in this Specification. Grout, where required as shown on the plans, will be subsidiary to this bid item.

5.24. **Removing Pressure-Reducing Stations**. Payment for removing pressure-reducing stations will be made at the unit price bid for "Removing Pressure Reducing Station." This price is full compensation for performing the necessary excavation; backfill; finish grading; pipe removal; structure removal; and tools, equipment, and incidentals.

5.25. **Wet Connections**. Payment for wet connections will be made at the unit price bid for "Wet Connections" of the sizes specified.

5.26. **Extra Hand Excavation or Extra Machine Excavation**. Payment for extra hand excavation or extra machine excavation will be made at the unit price bid for "Extra Hand Excavation" or "Extra Machine Excavation." This price is full compensation for labor, hand tools, machines, dewatering, and handling and properly disposing of any excess excavated material not suitable for bedding or backfill for this project.

5.27. **Adjusting Manholes**. 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 "Water Main (Adj Exist Manhole)." This price is full compensation for replacement of air release and vacuum release valve and installation of the standard bollards as shown on the plans; for materials including backfill as required; and for excavation, tools, equipment, labor, and incidentals.

Trench excavation protection or temporary special shoring for trenches greater than 5 ft. in depth, or sloping the sides of these trenches to preclude collapse, will be measured and paid for as required by Item 402 or Item 403.

Furnishing and placing bedding material will be subsidiary to the various bid items.

Providing fittings, including necessary concrete thrust blocking, pipe clamps, nipples, pipe coatings, and lubricants, will be subsidiary to the water mains in which they are installed.

In addition, providing fittings required due to plan changes or alterations in line and grade will be subsidiary to the water mains in which they are installed.

Furnishing and installing taps, risers, jumpers, blind flanges, cast iron sleeves, plugs, and reducers as required to disinfect and pressure-test the new mains will be subsidiary to the various bid items. In addition, necessary excavation and backfill, site grading, and maintenance until completion of pressure-testing will be subsidiary to the various bid items.

Unless otherwise shown on the plans, the work performed and materials furnished to support the pipes or conduits of public utilities will be subsidiary to the various bid items.

Furnishing and installing the nonmetallic pipe detection system, as well as the labor and materials necessary for the system, will be subsidiary to the various bid items. In addition, ensure that the detection system is complete, operational, and satisfactory to the utility owner.

Adjusting valve boxes will be subsidiary to the various bid items.

# Special Specification 7006
# Sanitary Sewers

## 1. DESCRIPTION

Furnish labor, materials, and equipment necessary to provide a complete sanitary sewer system in accordance and compliance with ANSI, AWWA, ASTM, American Standards Association (ASA), Steel Structures Painting Council (SSPC), ACI, and National Sanitation Foundation (NSF) standards; the plans; and Specifications, and in compliance with the Department's Utility Accommodation Policy (43 TAC § 21.31–21.55).

The abbreviations ANSI, AWWA, ASTM, ASA, SSPC, ACI, and NSF in this Specification refer to the following organizations.

- **ANSI**. American National Standards Institute.
- **AWWA**. American Water Works Association.
- **ASTM**. American Society for Testing and Materials.
- **ASA**. American Standards Association.
- **SSPC**. Steel Structures Painting Council.
- **ACI**. American Concrete Institute.
- **NSF**. National Sanitation Foundation.

When referring to the specifications of the above organizations, it means the latest standard or tentative standard in effect on the date of the proposal.

The size and location of utility lines shown on the plans were obtained from field surveys and from the various utility companies. The Department does not assume responsibility for the accuracy of the information presented, nor does it warrant that every utility line is shown.

## 2. MATERIALS

Furnish new and unused materials for this project unless otherwise specified on the plans. Provide a manufacturer's certificate of compliance for quality control of materials unless otherwise shown on the plans, except for the inspection requirements of Item 464, "Reinforced Concrete Pipe."

2.1. **Circular Concrete Pipe**. Provide circular concrete pipe 36 in. in diameter and greater conforming to the class specified on the plans and in accordance with Item 464. Circular concrete pipe less than 36 in. in diameter is not allowed. Furnish polyvinyl-chloride (PVC-) lined concrete pipe interiors for corrosion protection. See Section 2.9., "Plastic Liner for Concrete Pipes."

Upon delivery to the trenches, the pipe and specials will be inspected for transportation and handling damages incurred after acceptance at the source of manufacture. Repair the pipe if necessary. If, in the opinion of the Engineer, the repairs are sound, properly finished, and cured, and the repaired pipe conforms to these Specifications, it will be acceptable.

Unless otherwise specified on the plans, for concrete pipe, use corrosion-resistant rubber gasket joints of the "push-on" type that meet ASTM C443.

2.2. **PVC Pipe and Fittings**. For PVC pipe, use steel casing meeting Section 2.8., "Steel Casing Pipe."

Use lubricant for assembly that has no detrimental effects on the gasket or pipe and is of the type recommended by the pipe manufacturer.

Furnish a manufacturer's certification that the pipe and fittings being furnished on the project meet this Specification. Ensure written approval accompanies this certification to the project site, before installing the pipe and fittings.

Provide pipe and fittings that are free of defects that, in the judgment of the Engineer, would hinder their ability to function as planned.

2.2.1. **Gravity Sewer**. Provide plastic pipe and fittings meeting ASTM D3034 SDR35, D2241 or D3034 SDR26, F679 SDR35, or F794.

2.2.2. **Force Mains**. Provide PVC pipe for force mains meeting or exceeding AWWA C 900/905. Use ductile iron (Class 52) fittings for force main pipes.

2.2.3. **Water Main Crossings**. If constructing gravity or force main sewers in the vicinity of water mains, meet *Rules and Regulations for Public Water Systems* adopted in 1992 by the Texas Water Commission (now TCEQ).

2.3. **Ductile Iron Pipe (DIP) and Fittings**. Provide DIP that meets ANSI A 21.51 (AWWA C 151), Class 53. Unless otherwise specified on the plans, determine the pipe thickness based on the depth of cover and an internal pressure of 150 psi. Furnish pipe in nominal 18-ft. or 20-ft. lengths.

Provide fittings for use with DIP that meet ANSI A 21.10 (AWWA C 110). Design the fittings for a minimum working pressure of 150 psi.

Provide joints for DIP of the type in accordance with ANSI A 21.11 (AWWA C 151) for push-on or ANSI A 21.15 for flanged end.

2.4. **Line Interiors**. Provide lined interiors meeting ANSI A 21.4, cement-lined with seal coat, or ANSI A 21.16 fusion-bonded epoxy coating for interior. Comply with NSF 61.

2.5. **Sanitary Sewer and Force Main Interiors**.

2.5.1. **Preparation**. Provide commercial blast cleaning conforming to SSPC-SP 6.

2.5.2. **Liner Thickness**. Provide a nominal liner thickness of 40 mils for the pipe barrel interior and at least 6 mils–10 mils at the gasket groove and outside spigot end to 6 in. back from the end.

2.5.3. **Testing**. Perform testing in accordance with ASTM G62, Method B, for voids and holidays. Provide written certification.

2.5.4. **Acceptable Lining Materials**. Provide approved virgin polyethylene conforming to ASTM D1248, with inert fillers and carbon black to resist ultraviolet (UV) degradation during storage, heat-bonded to the interior surface of pipe and fittings.

2.5.4.1. **Ceramic Epoxy Protection**. For the exterior of sanitary sewers, furnish a prime coat and outside asphaltic coating conforming to ANSI A 21.10, ANSI A 21.15, or ANSI A 21.51 for pipe and fittings in open-cut excavation and in casings.

2.6. **Gaskets**. Furnish, when no contaminant is identified, plain rubber (styrene-butadiene rubber) gasket material in accordance with ANSI A 21.11 or ASTM F477 (one bolt only). For flanged joints, furnish a 1/8-in. thick gasket in accordance with ANSI A 21.15.

2.7. **Fiberglass Pipe and Fittings**. Provide centrifugally cast fiberglass pipe in accordance with ASTM D3262 and ASTM D3681. Ensure the actual outside diameter (OD) of the pipe is in accordance with ASTM D3754, Table 3. The standard pipe length is approximately 20 ft. A maximum 10% of the lengths, excluding special order pipes, may be supplied in random lengths.

Ensure the manufacturer uses only polyester resin systems with a proven history of performance in this application. Use only the historical data collected from applications of a composite material of similar construction and composition as the proposed product.

For the reinforcing glass fibers used to manufacture the components, use the highest quality commercial-grade glass filaments with binder and sizing compatible with impregnating resins.

Silica sand or other suitable materials may be used for fillers.

If resin additives, such as pigments, dyes, and other coloring agents, are used, ensure they are not detrimental to the performance of the pipe and they do not impair visual inspection of the finished product.

Provide gaskets supplied by approved gasket manufacturers in accordance with ASTM 477 and that are suitable for the service intended.

Provide flanges, elbows, reducers, tees, and other fittings capable of withstanding operating conditions when installed. They may be contact-molded or manufactured from metered sections of pipe joined by glass-fiber reinforced overlays.

Use a stiffness class of centrifugally cast fiberglass pipe that satisfies design requirements under ASTM D3262 but that is not less than 46 psi when used in direct-bury operation, or 36 psi when installed in a tunnel liner.

Provide centrifugally cast fiberglass pipe with an internal liner resin suitable for service as sewer pipe and that is highly resistant to exposure to sulfuric acid in accordance with ASTM D3681.

Supply pipe manufactured by the centrifugal casting process. An acceptable manufacturer is Hobas Pipe, USA, Inc., or approved equal.

Provide a manufacturer's certification that the pipe and fittings furnished on the project meet this Specification. Written approval must accompany this certification to the project site, before installing the pipe and fittings.

Furnish pipe and fittings that are free of defects that, in the judgment of the Engineer, would hinder their ability to function as planned.

2.8. **Steel Casing Pipe**. Provide minimum wall thicknesses in accordance with those shown in Table 1 for HS-20 live loads and depths of bury of up to 16 ft.

Supply the pipe in double random lengths, of at least 16 ft. and at most 40 ft., unless otherwise shown on the plans. Bevel the ends of the pipe for field butt-welding. Provide welder qualification in accordance with AWWA C 206.

**Table 1**
**Casing Pipe**

| Casing Pipe Size (in.) | Outside Diameter (in.) | Min. Wall Thickness (in.) | Approximate Weight Uncoated (lb./ft.) |
|---|---|---|---|
| 6 | 6.625 | 0.219 | 14.97 |
| 8 | 8.625 | 0.219 | 19.64 |
| 10 | 10.750 | 0.219 | 24.60 |
| 12 | 12.750 | 0.219 | 29.28 |
| 14 | 14.000 | 0.219 | 32.00 |

**Table 1**
**Casing Pipe**

| Casing Pipe Size (in.) | Outside Diameter (in.) | Min. Wall Thickness (in.) | Approximate Weight Uncoated (lb./ft.) |
|---|---|---|---|
| 16 | 16.000 | 0.219 | 36.86 |
| 20 | 20.000 | 0.250 | 52.73 |
| 24 | 24.000 | 0.250 | 63.41 |
| 30 | 30.000 | 0.250 | 79.43 |
| 36 | 36.000 | 0.250 | 95.45 |
| 42 | 42.000 | 0.250 | 111.50 |

Note—It is the Engineer's responsibility to review the design for conditions more extreme than those indicated by this Specification and to design accordingly. Do not use a thickness of the pipe wall less than that defined in this table.

Furnish steel casing pipe coated with coal-tar enamel externally and with polyamide epoxy internally.

2.9. **Plastic Liner for Concrete Pipes**. Furnish plastic liner sheets, joint, corner, and weld strips, manufactured from a high molecular weight thermoplastic polymer compounded to make a permanently flexible material suitable for use as a protective liner in pipe or other structures. Ensure PVC resin constitutes at least 99% by weight of the resin used in the formulation. Co-polymer resins are not permitted.

Anytime during the manufacture or before the final acceptance of the work, the Engineer may sample specimens taken from sheets, strips, or welded joints for testing.

Changes in formulation are permitted only after notifying the Engineer and after the manufacturer demonstrates that the new plastic liner meets or exceeds requirements for chemical resistance and physical properties.

Furnish the plastic liner as manufactured by Ameron T-Lok; Poly-Tee, Inc.; or approved equal.

Provide plastic liner sheets, including locking extensions, joints, corners, and welding strips, that are free of cracks, cleavages, or other defects adversely affecting the protective characteristics of the material.

Except at shop welds, ensure plastic liner sheets, joint, corner, and weld strips have the properties shown in Table 2 when tested at 77°F ±5°F.

**Table 2**
**Chemical Resistance Test**

| Property | Initial Result | After Exposure for 112 Days in Chemical Solutions |
|---|---|---|
| Tensile strength, Min. | 2,200 psi | 2,100 psi |
| Elongation at break, Min. | 200% | 200% |
| Shore diameter, Type D | Within 1 sec. 50–60 | ±5 (with respect to initial test result) |
| | 10 sec. 35–50 | ±5 |
| Weight change | – | ±1.5% |

2.10. **Liner for DIP**. Furnish pipe internally lined with ceramic epoxy Protecto 401 or virgin polyethylene in accordance with ASTM D1248, compounded with inert fillers and carbon black to resist UV light degradation during storage.

Heat-bond the liner to the interior of the pipe and fittings over a blast-cleaned surface as recommended by the manufacturer or SSPC-SP 6.

Provide a nominal liner thickness of 40 mils–50 mils with a minimum thickness of 35 mils and covering surfaces exposed to sanitary sewage.

Test for voids and holidays in accordance with ASTM G62, Method B, and provide a manufacturer's certification.

Furnish polyline liner pipe manufactured by U.S. Pipe and Foundry Company, Polybond by American Cast Iron Pipe Company, or an approved equal.

Apply a polyamide epoxy prime coat to the exterior and ensure the outside asphaltic coating is in accordance with ANSI A 21.10, ANSI A 21.15, ANSI A 21.51, or AWWA C 218 for pipe and fittings in open-cut excavation and in casings.

Use a polyurethane coating for the exterior conforming to the requirements of the approved manufacturer, CORROPIPE II – TX, Madison Chemical Industries, Inc., for polyurethane coatings on steel pipe or DIP.

2.11. **Polyethylene Film Wrap**.

2.11.1. **General**. Except where noted on the plans, use polyethylene film or tape as a wrap to protect DIP and fittings only in open ditch placements. Use polyethylene film conforming to this Specification.

2.11.2. **Film**. For polyethylene film, use virgin polyethylene in accordance with ASTM D1248 and AWWA C 105, Type I, Class C, Category 5, Grade E-5, 2.5%–3.0% carbon black content. Unless otherwise specified on the plans, use film 8 mils thick and with a tensile strength of 1,200 psi–2,500 psi with elongation up to 600%. Also, ensure the dielectric strength is 800 V per mil of thickness. Furnish the film in either tubular form or sheet form. Furnish film supplied in tubular form in the minimum widths shown in Table 3.

**Table 3**
**Min. Width of Film Tube (Lying Flat)**

| Nominal Pipe Size (in.) | Push-On Joint Flat Tube Width (in.) |
|---|---|
| 4 | 20 |
| 6 | 20 |
| 8 | 24 |
| 10 | 27 |
| 12 | 30 |
| 14 | 34 |
| 16 | 37 |
| 18 | 41 |
| 20 | 45 |
| 24 | 54 |

Furnish film supplied in sheet form in a width equal to twice that shown for tube widths.

2.11.3. **Polyethylene Tape**. For the tape used to tape film edges and overlaps, use a 3-in. wide plastic-backed adhesive tape. Use Paleocene No. 900, Scotch Wrap No. 50, or approved equal.

2.12. **Concrete**. Unless otherwise shown on the plans, for concrete other than materials for pipe, use Class A concrete in accordance with the material requirements of Item 420, “Concrete Substructures,” and Item 421, “Hydraulic Cement Concrete.”

2.13. **Cement-Stabilized Sand**. Use cement-stabilized sand backfill containing at least 7% cement, per cubic yard of material, based on the dry weight of the aggregate in accordance with Tex-120-E, of material as placed. The materials consist of aggregate, hydraulic cement, and water. Use cement and water in accordance with the material requirements of Item 421. Furnish sand, free of deleterious matter, with a maximum Plasticity Index of 6 when tested by Tex-106-E.

2.14. **Backfill and Bedding Materials**. Unless otherwise specified on the plans, furnish sand for bedding of the sanitary sewer that is free of clay lumps, organic material, and other deleterious substances. Use sand that, when tested in accordance with Tex-106-E, has a maximum Plasticity Index of 7 and a maximum Liquid Limit of 25, and for which a maximum 40% passes the No. 200 sieve.

Use earth or native soil backfill consisting of soil containing no deleterious material, such as trash, wood fragments, organics, or other objectionable material. Furnish the material from the material removed from either the excavation or offsite sources. The material may consist of soil classified by the Unified Soil Classification System as CH, CL, SC, SP, SM, SW, or GC. Use earth backfill that meets the compaction requirements of this Specification and does not cause any settlement.

2.15. **Manholes**. Use materials for manholes in accordance with the material requirements of Item 465, "Junction Boxes, Manholes, and Inlets," and as shown on the plans, except that brick is not allowed. Use fiberglass manholes if shown on the plans.

If specified, furnish prefabricated fiberglass manholes conforming to the shape, size, dimension, and details shown on the plans. Unless otherwise shown on the plans, use manhole sections in accordance with ASTM D3753. Acceptable fiberglass manhole manufacturers are Containment Solutions Inc.; L.F. Manufacturing, Inc.; or an approved equal.

Stencil the date of manufacture and name or trademark of the manufacturer in 1-in. high letters on the inside of the barrel.

Unless a larger size is specified, use a 48-in. diameter barrel for fiberglass manholes. Construct wall sections of the appropriate thickness for the depth of manhole as specified in ASTM D3753, but no less than 0.48 in. thick.

Provide a fabricated reducer, bonded at the factory to form a single continuous unit at the top of the manhole barrel to accept concrete grade rings and cast iron frame and cover. For the reducer, use an acceptable design with enough strength to safely support HS-20 loading.

For the manhole base, use a minimum 12-in. (under the invert) precast concrete base. For precast manhole bases, use an approved steel-reinforced design with enough strength to withstand the imposed loads. Include an acceptable joint in the base to receive a fiberglass pipe section forming the barrel of the manhole. Coat precast concrete base sections with Thane Coat TC300 or approved equal, as recommended by the manufacturer.

2.16. **Rings and Covers**. Use materials for rings and covers in accordance with the material requirements of Item 471, "Frames, Grates, Rings, and Covers." Use covers and rings conforming to the shapes and dimensions shown on the plans and marked with the wording and logos shown on the plans.

2.17. **Reinforcing Steel**. Furnish and place reinforcing steel in accordance with the material requirements of Item 440, "Reinforcement for Concrete."

2.18. **Mortar**. Furnish mortar comprising one part cement, two parts finely graded clean sand, and enough water to make the mixture plastic. When required by the Engineer, add a latex adhesive to the mortar. Use latex adhesive in accordance with DMS-8110, "Coatings for Concrete." Hydrated lime ASTM C207, Type S, or lime putty may be added to the mix up to a maximum 10% by weight of the total dry mix.

2.19. **Adjusting Manholes**. Furnish materials for adjusting manholes in accordance with the material requirements of Item 479, "Adjusting Manholes and Inlets," and as shown on the plans.

2.20. **Nonmetallic Pipe Detection**. If installing nonmetallic pipe longitudinally under ground, a method of detecting the location of the nonmetallic pipe is required. The specific method used is shown on the plans or as approved. This system may involve installing some components in the trench around the pipe that are detectable by a metal detector. Alternately, the system may involve some locating equipment capable of creating a nondestructive pressure wave that can be detected above ground using a portable detection device with audible and visual indicators. Ensure either system of detection is capable of accurately locating to a maximum depth of 3 ft. over the areas shown on the plans.

Ensure the selected system can locate lines under earth, concrete, and asphalt surfaces. Use equipment, materials, and installation as specified by the manufacturer.

2.21. **Air Release and Vacuum Relief Valves**. Provide combination air valves designed to fulfill the functions of air release, permitting escape of air accumulated in the line at high points of elevation while the line is under pressure and vacuum relief. Paint the valve exterior with an epoxy shop-applied primer.

2.21.1. **Air Release Valves**. Provide air release valves in combination with inlet, outlet connections, and orifice as specified on the plans. For valve materials, use ASTM 48, Class 30, cast iron; float and leverage mechanism with body and cover, ASTM A240 or ASTM A276 stainless steel; and orifice and seat, stainless steel against Buna-N or Viton mechanically retained with hex head nut and bolt. For other valve internals, use stainless steel or bronze.

2.21.2. **Air Release and Vacuum Valves**. Provide single-body standard combination or duplex-body custom combination valves as shown on the plans.

2.21.2.1. **2-in. and 3-in. Single-Body Valves**. Provide inlet and outlet sizes as shown on the plans and an orifice sized for a 100-psi working pressure. For valve materials, for the body, cover, and baffle, use ASTM A48, Class 35, or ASTM A126, Grade B, cast iron. For the plug or poppet, use ASTM A276 stainless steel. For the float, use ASTM A240 stainless steel. For the seat, use Buna-N. For other valve internals, use stainless steel.

2.21.2.2. **3-in. and Larger Duplex-Body Valves**. Provide air release valves as shown on the plans. For valve materials, for the body and cover, use ASTM A48, Class 35, cast iron. For the float, use ASTM A240 stainless steel. For the seat, use Type 304 stainless steel and Buna-N. For other valve internals, use stainless steel or bronze. Construct air release valves as specified in Section 2.21.1., “Air Release Valves.”

2.21.3. **Vacuum Release Valves**. Provide air inlet vacuum relief valves with flanged inlets and outlet connections as shown on the plans. For valve materials, for the valve body, use ASTM B584 bronze, Copper Alloy 836. For the spring, use ASTM A313, Type 304, stainless steel. For the bushing, use ASTM B584 bronze, Copper Alloy 932. For the retaining screw, use ASTM A276, Type 304, stainless steel. Set the valves to open under a pressure differential of 0.25 psi (maximum).

## 3. CONSTRUCTION

3.1. **Excavating and Backfilling**. Excavate and backfill as required to complete the work as outlined in this Specification; in accordance with construction requirements of Item 400, “Excavation and Backfill for Structures”; and as shown on the plans.

Construct sewer lines in open-cut trenches with vertical sides, except in those locations where the pipe is to be jacked, bored, tunneled, or augered. Construct the trench in accordance with the dimensions shown on the excavation and backfill diagram.

Sheath and brace trenches to the extent necessary to maintain the sides of the trench in a vertical position throughout the construction period. Protect excavation greater than 5 ft. in depth as required in accordance with Item 402, “Trench Excavation Protection,” or Item 403, “Temporary Special Shoring.”

Always open and excavate the trench to the finished grade for a minimum distance of 50 ft. in advance of the previously placed joint of pipe. To allow for possible adjustment of alignment and grade, positively locate existing sewer lines that will connect to the sewer under construction, well in advance of making those connections.

Construct sanitary sewers in dry trenches. Perform additional work as necessary, such as dewatering or well pointing, placing additional sheathing, or placing a concrete seal in the bottom of the trench, to accomplish this objective. This work, if necessary, is considered part of the pertinent bid items.

If it is necessary to excavate trenches adjacent to improved property, take precautions necessary to prevent damaging or impairing that property. If it is necessary to disturb property features such as grass, shrubs, and driveways, restore such improvements to their original condition.

3.1.1. **Existing Streets**. Unless otherwise shown on the plans, open-cut existing streets.

If sanitary sewer construction requires cutting through existing streets outside the limits of new street construction, replace them in kind in conformance with the pertinent Specifications in the proposal and as directed.

Cut back the existing pavement at least 1 ft. on each side of the sanitary sewer trench before replacing concrete and asphalt paving. Additional trench width may be required for unstable conditions. If this repaired area is to remain after final construction, then the repair area must be full-lane width from expansion joint to expansion joint for concrete pavement or the length of the repair for asphalt pavement.

If, in the opinion of the Engineer, a single lane closure is insufficient to maintain traffic across a trench, construct temporary access as necessary to safely maintain the traffic flow.

If the proposed sanitary sewer parallels the edge of an existing permanent pavement (e.g., concrete pavement or concrete base with asphalt surface) and is 3 ft. or less from the edge of that pavement, protect the trench with timber sheathing and bracing. Leave the bracing in place at intervals of 5 ft. maximum, for the duration of the excavation.

Keep the street surface adjacent to the trench free of surplus spoil. Place construction materials at locations that will minimize interference with the traveling public.

A maximum two street intersections may be closed at any time, unless otherwise authorized by the Engineer in writing.

3.1.2. **Cutting and Restoring Pavement**. If installing sewers in streets or other paved areas, the work must include saw-cutting the pavement and asphalt stabilized base (if any), removing the foundation base to neat lines, and replacing these materials after sewer excavation and backfill are complete. The type and thickness of replacement materials are shown on the plans. Performing work on or making repairs to damaged base and pavement within the project limits will be measured and paid for under the applicable Specifications.

If excavating in streets or highways, maintain traffic and provide traffic control as shown on the plans.

When allowed by the construction sequence shown on the plans or when directed, use a “temporary concrete cap” of the depth and class of concrete shown on the plans, or as otherwise directed, instead of a permanent repair.

3.2. **Bedding**. Before laying the pipe, shape the bedding material to conform to the OD of the pipe as shown on the plans. Carefully prepare bell holes to fit the bell where using bell and spigot pipe.

3.3. **Laying Pipe**.

3.3.1. **General**. Lay sewers in a straight line, so that light can be seen from one manhole to the other, even for the smaller size sewers. Accurately lay the pipe to line and grade, with the spigot end downstream entering the bell of the next joint of pipe. Fit pipes and fittings together and match them so they form a sewer with a smooth, watertight, and uniform invert. Take measures to provide uniform bearing for the entire length of the pipe.

Install sewer lines meeting the minimum separation distance from any potable water line, as required by TCEQ design criteria for sewage systems, TAC § 317.13, Appendix E.

Lay pipe to the lines and grades shown on the plans. To ensure proper placement, use adequate surveying methods and equipment, and employ personnel competent in the use of this equipment. Unless otherwise approved, the maximum allowable deviation of the pipe from the horizontal and vertical alignment indicated on the plans is 0.10 ft. Measure and record the as-built horizontal alignment and vertical grade at most every 50 ft. on the onsite recorded plans.

Submit a mylar set of plans with this as-built information to the Engineer for final acceptance.

During pipe-laying operations, always keep pipe trenches free of water that might impair pipe-laying operations. Ensure holes for bells are of ample size to prevent bells from contacting the subgrade. Carefully grade the pipe trenches to provide uniform support along the bottom of the pipe.

Do not lay more than 50 ft. of pipe in the trench ahead of backfilling operations. If the pipe-laying operations are interrupted for more than 48 hr., cover the pipe laid in the trench simultaneously on each side of the pipe to avoid lateral displacement of the pipe and damage to the joints. If adjustment of the position of a length of pipe is required after it has been laid, remove and re-lay it in accordance with these Specifications at no expense to the Department. After completing pipe-laying and joining operations, clean the inside of the pipe and remove any debris.

Use caution to prevent damage to the coating or polyethylene film wrap when placing backfill. Place backfill in accordance with this Specification.

Do not place more than 1,000 ft. of pipe on publicly used streets ahead of the trench-excavating machine. Obtain permission, in writing, from the owner or the owner's agent before placing materials or equipment on private property.

Regardless of the type of pipe being used, place sand bedding in the bottom of the trench and compact it to a depth of 6 in. Carefully grade the bedding and excavate bell holes.

Lay pipe with bell ends facing in the direction of laying, unless otherwise directed.

Adjust the pipe and fittings to be at their proper locations and prepare each joint as specified on the plans and by the Engineer. While laying each joint of pipe in the trench, center the spigot end in the bell of the previously laid pipe. Force the pipe home and bring it to correct line and grade. Ensure each length of pipe rests on the bottom of the trench throughout its entire length.

If laying of pipe is discontinued for the day or for an indefinite period, tightly place a cap or plug in the end of the last pipe laid to prevent intrusion of water. When water is excluded from the interior of PVC pipe, place enough backfill on the pipe to prevent floating. Schedule the work to prevent the possibility of flotation. Remove pipe that has floated from the trench and re-lay it as directed.

When PVC pipe is assembled on top of the trench, allow it to cool to ground temperature before backfilling to prevent pull out due to thermal contraction.

3.3.2. **PVC Pipe and Fittings**. Splicing is not allowed unless the required length of a straight section of pipe exceeds 30 ft. The Engineer may waive this requirement to meet special conditions.

Use devices required for attaching the pipe to portions of structures or to other types of pipe that are shown on the plans or as approved. Install a water stop gasket and clamp at each PVC connection to a manhole.

After installing, clean and paint pipe and fittings that are exposed to view in the completed structure, as shown on the plans.

3.3.3. **DIP and Fittings**. Provide and operate proper and suitable tools and appliances for safely and conveniently handling the pipe and fittings. Use caution to prevent damaging the pipe coating. Examine pipe for defects

and do not lay pipe that is known to be defective. If any defective pipe is discovered after being laid, remove and replace it with sound pipe at no expense to the Department. If the pipe requires cutting, perform it in conformance with the manufacturer's recommendations for pipe 12 in. in diameter and smaller. Use approved cutting methods for larger pipes. Ensure each cut is smooth and at right angles to the axis of the pipe.

3.3.4. **Thrust Restraint**. Unless otherwise shown on the plans, provide Portland cement concrete thrust blocking for force mains up to 12 in. in diameter, to prevent movement of buried lines under pressure at bends, tees, caps, valves, and hydrants. Place concrete in accordance with details on the plans. Place thrust blocks between undisturbed ground and fittings. Anchor the fittings to the thrust blocks so that the pipe and fitting joints are accessible for repairs. Extend the concrete from 6 in. below the pipe or fitting to 12 in. above.

For force mains larger than 12 in. in diameter, and where indicated on the plans, provide restrained joints conforming to the requirements of the force main pipe material Specifications. Install restrained joints for the length of pipe on both sides of each bend or fitting for the full length shown on the plans.

Horizontal and vertical bends with deflection angle between 0° and 10° do not require thrust blocks or harnessed or restrained joints.

For horizontal and vertical bends with deflection angle between 10° and 90°, provide thrust restraint as shown on the plans.

Provide thrust restraint at tees, plugs, blowoff drains, valves, and caps, as indicated.

Reinforced concrete encasement of force main pipe and fittings may be used instead of manufactured joint restraint systems. Provide alternate joint restraint systems using reinforced concrete encasement that conform to following design requirements.

- Ensure design calculations are performed and sealed by a licensed professional engineer in the State of Texas.
- Base design calculations on soil parameters qualified in a geotechnical report for the site where alternate thrust system will be installed. When data are not available for the site, use parameters recommended by a geotechnical engineer.
- The design system pressure is the specified test pressure.
- Use the following safety factors in sizing the restraint system.
  - Apply a factor of safety equal to 1.5 for passive soil resistance.
  - Apply a factor of safety equal to 2.0 for soil friction.
- Contain the encasement entirely within the standard trench width and terminate it on both ends at the pipe bell or coupling.
- Design the concrete encasement reinforcement steel for all loads, including internal pressure and longitudinal forces. Design the concrete in accordance with ACI 318.

Install piping and fittings true to alignment with rigid support. Provide anchorage where required. Repair any damage to linings before the pipe is installed. Clean out each length of pipe before installation. Adhere to the pipe manufacturer's recommendations.

Ensure the deflection at joints does not exceed that recommended by the pipe manufacturer. Provide fittings, in addition to those shown on the plans, if required, in areas where conflict exists with existing facilities.

Fabricate flanged joints using gaskets, bolts, bolt studs with a nut on each end, or studs with nuts where the flange is tapped. Use the number and size of bolts that conform to the same ANSI standard as the flanges.

Tighten bolts in flanged joints or mechanical joints alternately and evenly.

3.3.5. **Fiberglass Pipe**. Do not use stiffening ribs or rings. Provide a water stop flange (wall pipe) for connection to existing cast-in-place manholes.

If the pipe is cut in the field or the interior lining is disturbed, recoat the interior with a similar quantity of the liner resin in accordance with this Specification.

Do not exceed forces recommended by the manufacturer for coupling pipes. If excessive force is required, remove the coupling, determine the source of the problem, and correct it.

When jointing the pipe, do not exceed the deflection angle, measured by mandrel, permitted by the manufacturer, unless otherwise directed.

Either affix gaskets to the pipe using a suitable adhesive or install them in such a manner to prevent the gasket from rolling out of the pipe's precut groove.

3.4. **Manholes**. Construct manholes in accordance with Item 465 and with the details shown on the plans.

3.5. **Adjusting Manholes**. Adjust manholes in accordance with the construction requirements of Item 479 and as shown on the plans.

Elevations of manholes may be raised by using precast concrete rings. Elevations of manholes may be lowered by removing existing cast-in-place walls, adjusting rings, or the top section of the barrel below the new elevation and then rebuilding or raising the elevation to the proper height.

Salvage and reuse cast iron frames and covers. Protect or block-off manhole or inlet bottoms by using wood forms shaped to fit so that no debris or soil falls to the bottom during adjustment.

Install a cast-in-place slab at the top of the manhole barrel to receive the cast iron frame and cover. Form concrete slabs at least 6 in. thick. Set the cast iron frame for the manhole cover in a full mortar bed and adjust it to the established elevation. If placing in streets, adjust covers to be flush with the top of the pavement.

For fiberglass manhole adjustments, install concrete-grade rings for height adjustment, as required. Construct the chimney on the flat shoulder. Do not load the manhole except on the load-bearing shoulder of the manhole. The maximum adjustment height is 18 in.

Use a cut length of approved fiberglass-reinforced pipe to create a finished liner inside the adjustment rings. Cut the pipe to fit between the casting and the top of the fiberglass manhole reducer. Completely seal the liner pipe to the casting and to the manhole reducer section with sealant as recommended by the manufacturer.

Set the cast iron frame on top of the cone or adjustment rings using approved sealant materials and adjust the elevation of the casting cover to match the pavement surface. For manholes in unpaved areas, set the top of the frame at least 6 in. above the existing ground line unless otherwise shown on the plans.

3.6. **Service Connections**. If existing service connections are tied into existing sewers that will be abandoned, reconnect such connections to the proposed sewers as shown on the plans or as directed.

If sewers are more than 6 ft. in depth from the finished grade to the top of the pipe, construct service connections by placing stacks on the sewer line.

Construct sewer stacks in a manner approved and in accordance with the details shown on the plans. If stacks are to be adjusted, make the adjustments as directed by the Engineer.

If sewers are 6 ft. or less in depth from the finished grade to the top of the pipe, construct service connections by placing wyes or tees in the sewer line at each location and using 1/4 or 1/8 bends where necessary to tie into the existing house sewer lead.

For stub-outs, use PVC sewer pipe, 6-in.–10-in. in diameter, in accordance with ASTM D1784 and ASTM 3034 with a cell classification of 12454-B. Use a standard dimension ratio (SDR) (ratio of diameter to wall thickness) of 26 for pipe 12 in. in diameter or less and an SDR of 35 for larger pipe.

Use gasket-jointed PVC pipe with the gasket in accordance with ASTM D3212.

Select the service connection pipe diameter to match the existing service diameter, but use a minimum diameter of 6 in.

Furnish a one-piece prefabricated saddle, made either of polyethylene or PVC, with a neoprene gasket for connection to high-density polyethylene. Use full-body fittings for new PVC installation.

For connection between a stub-out and existing service, use a minimum 6-in. diameter flexible PVC coupling, Fernco Adapter, or approved equal as needed.

Use 1/2-in. stainless steel bands to secure saddles to the liner pipe and the couplings to the service line.

Reconnect service connections, including those to unoccupied or abandoned buildings or to vacant lots, unless otherwise directed.

Include reconnected services on the as-built plans. Record the exact distance from each service connection to the nearest downstream manhole.

Test the service connection before backfilling. Use backfill in accordance with this Specification and details as shown on the plans.

3.7. **Jacking, Boring, or Tunneling Pipe**.

3.7.1. **General**. Perform jacking, boring, or tunneling for sanitary sewers at the locations shown on the plans and at other locations specifically designated.

Unless otherwise shown on the plans, provide casing pipe in accordance with Section 2.8., “Steel Casing Pipe.”

3.7.2. **Jacking**. Perform jacking in accordance with Section 476.3.1., “Jacking.”

3.7.3. **Boring**. Perform boring in accordance with Section 476.3.2., “Boring or Tunneling.”

If sewer lines cross underneath driveways (16 ft. wide or less) and sidewalks, install pipe in tight-fitting augered holes.

If the centerline of the proposed sanitary sewer is 10 ft. or less from the centerline of an 8-in. diameter or larger growing tree, place the pipe in a tight-fitting augered hole. Extend the bored hole at least 4 ft. beyond each side of the tree.

3.7.4. **Tunneling**. Perform tunneling in accordance with Section 476.3.3., “Tunneling.”

3.8. **Handling of Pipe and Accessories**.

3.8.1. **General**. Unload pipe, fittings, and accessories at the point of delivery and haul them to the project site. Distribute the material opposite or near to the place where it will be laid in the trench. Do not drop the materials. Do not skid or roll pipe handled on skid ways against pipe already on the ground.

Load, transport, unload, and otherwise handle pipe and fittings in a manner and by methods that will prevent damage to them. Handle and transport pipe using equipment designed, constructed, and arranged to prevent damage to the pipe, lining, and coating. Bare chains, hooks, metal bars, or narrow skids or cradles are not permitted to contact the coatings. Ensure spiders are installed by the manufacturer at joint ends of fittings.

Hoist pipe from the trench side into the trench by using a sling of smooth steel cable, canvas, leather, nylon, or similar material.

During pipe construction operations, always use caution to prevent damage to the pipe, protective linings, and coatings.

If stacking pipe, package it on timbers. Place protective pads under the banding straps at the time of packaging.

If fork trucks are used to relocate pipe, pad the forks using carpet or some other suitable type of material. When relocating pipe using a crane or backhoe, use nylon straps, not chains or cables, around the pipe for lifting.

Do not lift pipe using hooks at each end of the pipe.

Repair or replace any damage to the pipe or the protective lining and coating, from any cause, during the installation of the pipeline and before final acceptance by the purchaser, at the expense of the Contractor, and in conformance with the applicable standards and as directed.

3.8.2. **Cleaning of Pipe and Accessories**. Remove lumps, blisters, and excess coating from the bell and spigot ends of DIP and fittings. Wire-brush the outside of the spigot and the inside of the bell and wipe clean, dry, and free of oil and grease before laying the pipe.

Remove foreign matter or dirt from the interior of sanitary sewer pipe and accessories and from the mating surfaces of the joints before lowering the material into the trench. During and after laying by approved means, keep the pipe and accessories clean.

Use chemicals such as cleaning solutions, detergents, and solvents with caution when cleaning PVC pipe.

3.9. **Abandoning Sanitary Sewers**. Where plans call for abandoning sanitary sewers, adhere to the following general procedure: After the replacement main is constructed, tested, and released, and after services are transferred to the replacement line, locate the line to be abandoned and trace it back to the feeder line, and at this point, cut, plug, and abandon it. Grout the pipe if required by the plans.

3.10. **Removing Sanitary Sewers, Casing, Force Main, and Manholes**. Remove sanitary sewers, casing, force mains, and manholes in accordance with Item 100, “Preparing Right of Way,” or as shown on the plans. This work includes removing and disposing of the pipe and appurtenances as shown on the plans or as directed. Excavation and backfill, as required, are considered part of this Item.

3.11. **Joining Pipe and Accessories**.

3.11.1. **General**. After thoroughly cleaning the inside of the bell and the outside of the spigot, install members in conformance with the manufacturer’s recommendation.

Mark pipe and accessories that are not furnished with a depth mark before assembling to assure that the spigot end is inserted to the full depth of the joint.

3.11.2. **PVC Pipe and Accessories**. Join plastic pipe in conformance with the instructions furnished by the manufacturer. Do not handle or install pipe joined using solvent-cementing techniques in the trench until after the joints are cured enough to prevent joint weakening.

Use lubrication for rubber-jacketed joints that is water-soluble, nontoxic, and nonsupporting of bacteria growth, and has no deteriorating effect on PVC or the rubber gaskets.

3.11.3. **DIP**. Except as noted on the plans, wrap DIP (including fittings and other appurtenances) with a polyethylene film wrap material.

3.11.4. **Fiberglass Pipe**. Unless otherwise shown on the plans, field-connect pipe with fiberglass sleeve couplings that use elastomeric sealing gaskets as the sole means to maintain joint water tightness. Ensure the joints meet the performance requirements of ASTM D4161.

3.11.5. **Diversion Pumping**. Provide continuous sanitary sewer service to users of the sewer system during construction and maintenance operations, by diverting the flow around such areas. Maintain sewer flow to prevent backup or overflow onto streets, yards, and unpaved areas, or into buildings, adjacent ditches, storm sewers, and waterways. Do not divert sewage outside the sanitary sewer system. During pump operation, provide an experienced operator onsite to monitor operation, adjust pumps, perform minor repairs to the system, and report problems.

3.12. **Installing the Nonmetallic Pipe Detection System**. Install the nonmetallic pipe detection system concurrently with placing the proposed pipe. Install this system as specified by the manufacturer and as approved. Install a complete, operational system that is satisfactory to the owner of the utility.

3.13. **Air Release and Vacuum Valves**. Inspect valves in open and closed positions to verify they are in satisfactory working condition. Install valves in conformance with the manufacturer's recommendation. Set manholes and vaults plumb as shown on the details, and center manholes on valves. Provide aboveground vents for manholes and vaults as shown on the plans.

## 4. TESTING SANITARY SEWERS FOR LEAKAGE

4.1. **Basic Requirements**. Ensure sewers, when tested in accordance with this Specification, do not show leakage of more than 50 gal. per 24 hr. per inch of inside diameter (ID), per mile of sewer.

4.2. **General**. Conduct testing under the supervision of the Engineer. It is the Engineer's option to conduct tests by either the infiltration method or the exfiltration method. On sewers larger than 24 in. in diameter, the tests may consist of visual inspection inside the sewer to locate leaks. The visual inspection method must be used for monolithic sewers. Where the section of sewer to be tested is entirely below the groundwater table that will provide the required test head, the test will ordinarily be made by the infiltration method.

Test the first section of each size or type of sewer laid on the job that is 300 ft. or greater in length, installed by each crew, to determine the adequacy of the materials and methods used and the proficiency of the crew. Backfill this section to at least 18 in. above the top of the pipe and test it without undue delay. If this initial section fails to meet the requirements of the test, make changes in methods, materials, and crew as necessary to correct the deficiency. It is the Engineer's option to require the Contractor to test any or all of the remaining sections of the sewer.

Completely backfill sewers, other than the first section described above, except at the stacks, before testing. It is the Contractor's option to make preliminary tests with at least 18 in. of backfill over the pipe to determine whether any need for repairs in the sewer is indicated. Such preliminary tests are entirely for the Contractor's information and will not be accepted instead of final tests.

Unless notified that the test will be made by the infiltration method, leave the tops of the stacks exposed and unplugged until after performing the leak test. Temporarily extend upward stacks that may terminate below the test level by installing an additional length of pipe in the top.

Notify the Engineer at least 24 hr. in advance of performing the tests.

If the bottom of the trench is below the groundwater level, provide suitable means at each manhole for readily determining the groundwater level until testing is completed or waived by the Engineer. This may, as an example, consist of a pipe no less than 3 in. in diameter, plugged at the bottom and perforated for at least the lower 3 ft., with the perforations wrapped with at least two thicknesses of burlap, set in the trench before backfilling. Remove such pipes or cut them off at least 2 ft. below ground after testing is completed or waived by the Engineer. Before removing, protect the pipes against damage and exclude earth or other material from them.

It is the Engineer's option to vary the procedures described in Section 4.3.1., "Infiltration Test," and Section 4.3.2., "Exfiltration Test," provided the methods used give an accurate measurement of the leakage occurring at the water levels specified.

4.3. **Testing Procedures (Gravity System)**.

4.3.1. **Infiltration Test**. This test may be used where the groundwater level rises to a plane that provides a test head no less than that specified for exfiltration tests. Stop all pumps and allow the groundwater to return to its normal level (at least the elevation as indicated above) and to remain so for at least 24 hr. (the pipe will be filled with water to the overflow depth), and ensure leakage flows at a uniform rate through the opening in the plug in the downstream end of the section of sewer being tested before starting the test. Determine leakage by measuring the flow through the opening in the downstream plug during a given time. Perform five measurements over a 2-hr. period. Use the average of the measurements, discarding any one of the five measurements, except the last, that varies by more than 50% from the average of the other four. If the results of the test are otherwise satisfactory, but the last of the five measurements shows leakage more than that permitted, continue the tests to determine whether additional leaks have developed during testing.

4.3.2. **Exfiltration Test**. It is the Contractor's option to keep the pipe full of water for 24 hr. before the test to permit absorption by the pipe. If the Contractor wishes to fill the pipe, notify the Engineer by the time backfill is completed. The Engineer will then give notice at least 48 hr. before the test is made to allow time for filling and soaking the pipe.

Supply plugs for this purpose. At least 2 hr. before the test starts, bleed-off the water to below the level of the top of the pipe at its lower end and allow it to remain so until the water level remains static at this level or continues to fall. Perform the test in the following manner.

Insert a watertight plug equipped with a pipe riser and brace it in the inlet opening of the downstream manhole. Insert and brace a similar plug, equipped with a suitable vent pipe that will permit the air to escape in the pipe at its upper end, in the outlet opening of the upstream manhole.

Fill the sewer and risers with water up to a level that is 2-1/2 ft. above the highest point in the sewer pipe, service connection, or groundwater table, whichever is highest, plus the vertical distance from the invert of the sewer at its lower end up to the level of the groundwater, where such groundwater exists above the invert of the sewer.

Fill the sewer with water continuously as rapidly as the supply will permit. Complete this filling in at least 2 hr. for sewers 12 in. in diameter or smaller, 3 hr. for sewers 15 in.–24 in. in diameter, and 4 hr. for larger sewers. Over a 1-hr. period, measure the leakage during the test period by adding measured quantities of water to maintain the water level in the test structure. The quantity of water added to maintain the initial water level is the amount of leakage.

Criteria and allowable leakage for exfiltration and infiltration tests are shown in Table 4.

**Table 4**
**Criteria for Exfiltration and Infiltration Water Tests**

| Diameter of Riser or Stack[1] (in.) | Volume per Inch of Depth | | Allowable Leakage[2] | |
|---|---|---|---|---|
| | (cu. in.) | (gal.) | Pipe Diameter (in.) | Gal. per Minute per 100 ft. |
| 1 | 0.7854 | 0.0034 | 6 | 0.0039 |
| 2 | 3.1416 | 0.0136 | 8 | 0.0053 |
| 2.5 | 4.9087 | 0.0212 | 10 | 0.0066 |
| 3 | 7.0686 | 0.0306 | 12 | 0.0079 |
| 4 | 12.5664 | 0.0306 | 15 | 0.0099 |
| 5 | 19.6350 | 0.0544 | 18 | 0.0118 |
| 6 | 28.2743 | 0.1224 | 21 | 0.0138 |
| 8 | 50.2655 | 0.2176 | 24 | 0.0158 |
| | | | 27 | 0.0177 |
| | | | 30 | 0.0197 |
| | | | 36 | 0.0237 |
| | | | 42 | 0.0276 |

1. For other diameters, multiply the square of diameter by the value for 1-in. diameter.

2. Equivalent to 50 gal. per inch of ID per mile in 24 hr.

4.3.3. **Low-Pressure Air Test**. For sanitary sewers of less than 36-in. average IDs, conduct testing in sections less than 300 ft. long. For shorter runs, conduct the low-pressure air test from manhole to manhole. Test 36-in. and larger sewer mains every two runs of pipe, with one pipe joint connection in between.

Perform the low-pressure air test in accordance with ASTM C828 and ASTM C924, using holding times no less than those listed in Tables 5 and 6.

Note 1: Tables are based on the following equation.

$$T = 0.0850(D)(K)/(Q)$$

- T = Time for pressure to drop 1.0 lb. per square inch gauge (psig), in seconds
- K = 0.000419(D)(L), but no less than 1.0
- D = Average ID, in inches
- L = Length of line of the same pipe size being tested, in feet
- Q = Rate of loss = 0.0015 cu. ft. per minute per square foot of internal surface area

Note 2: Add 1.0 psig for each 2.3 ft. of water above the highest point in the sewer.

Note 3: When two sizes of pipe are involved, compute the time by using the ratio of the lengths involved (e.g., using 400 ft. of 10-in. pipe and 200 ft. of 6-in. pipe).

$$\text{Time} = \frac{\text{Length}_1 \times \text{Time}_1 + \text{Length}_2 \times \text{Time}_2}{\text{Length}_1 + \text{Length}_2}$$

$$= \frac{400 \times 15{:}50 + 200 \times 5{:}40}{400 + 200} \qquad = \frac{400 \times 950 + 200 \times 340}{400 + 200}$$

$$= 747 \text{ sec.} \qquad = 12{:}27 \text{ min.:sec.}$$

**Table 5a**
**Acceptance Testing for Sanitary Sewers**
**Time Allowed for Pressure Loss from 3.5 psig–2.5 psig**

| Pipe Diameter (in.) | Min Time (min.:sec.) | Length for Min Time (ft.) | Time for Longer Length (sec.) | Specification Time for Length (L) (min.:sec.) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 100 ft. | 150 ft. | 200 ft. | 250 ft. | 300 ft. |
| 6 | 5:40 | 398 | 0.8548 | 5:40 | 5:40 | 5:40 | 5:40 | 5:40 |
| 8 | 7:33 | 298 | 1.5196 | 7:33 | 7:33 | 7:33 | 7:33 | 7:36 |
| 10 | 9:27 | 239 | 2.3743 | 9:27 | 9:27 | 9:27 | 9:54 | 11:52 |
| 12 | 11:20 | 199 | 3.4190 | 11:20 | 11:20 | 11:20 | 14:15 | 17:06 |
| 15 | 14:10 | 159 | 5.3423 | 14:10 | 14:10 | 17:48 | 22:16 | 26.43 |
| 18 | 17:00 | 133 | 7.6928 | 17:00 | 19:14 | 25:39 | 32:03 | 38:28 |
| 21 | 19:50 | 114 | 10.4708 | 19:50 | 26:11 | 34:54 | 43:38 | 52:21 |
| 24 | 22:40 | 99 | 13.6762 | 22:48 | 34:11 | 45:35 | 56:59 | 68:23 |
| 27 | 25:30 | 88 | 17.3089 | 28:51 | 43:16 | 57:42 | 72:07 | 68:33 |
| 30 | 28:20 | 80 | 21.3690 | 35:37 | 53:25 | 71:14 | 89:02 | 106:51 |
| 33 | 31:10 | 72 | 25.8565 | 43:06 | 64:38 | 86:11 | 107:44 | 129:17 |

**Table 5b**
**Acceptance Testing for Sanitary Sewers**
**Time Allowed for Pressure Loss from 3.5 psig–2.5 psig**

| Pipe Diameter (in.) | Min Time (min.:sec.) | Length for Min Time (ft.) | Time for Longer Length (sec.) | Specification Time for Length (L) (min.:sec.) | | | |
|---|---|---|---|---|---|---|---|
| | | | | 350 ft. | 400 ft. | 450 ft. | 500 ft. |
| 6 | 5:40 | 398 | 0.8548 | 5:40 | 5:42 | 6:25 | 7:07 |
| 8 | 7:33 | 298 | 1.5196 | 8:52 | 10:08 | 11:24 | 12:40 |
| 10 | 9:27 | 239 | 2.3743 | 13:51 | 15:50 | 17:48 | 19:47 |
| 12 | 11:20 | 199 | 3.4190 | 19:57 | 22:48 | 25:39 | 28:30 |
| 15 | 14:10 | 159 | 5.3423 | 31:10 | 35:37 | 40:04 | 44:31 |
| 18 | 17:00 | 133 | 7.6928 | 44:52 | 51:17 | 57:42 | 64:06 |
| 21 | 19:50 | 114 | 10.4708 | 61:05 | 69:48 | 78:32 | 87:15 |
| 24 | 22:40 | 99 | 13.6762 | 79:47 | 91:10 | 102:34 | 113.58 |
| 27 | 25:30 | 88 | 17.3089 | 100:58 | 115:24 | 129:49 | 144:14 |
| 30 | 28:20 | 80 | 21.3690 | 124:39 | 142:28 | 160:16 | 178:05 |
| 33 | 31:10 | 72 | 25.8565 | 150:50 | 172:23 | 193:55 | 215:28 |

**Table 5c**
**Acceptance Testing for Sanitary Sewers**
**Time Allowed for Pressure Loss from 3.5 psig–psig**

| Pipe Diameter (in.) | Min Time (min.:sec.) | Length for Min Time (ft.) | Time for Longer Length (sec.) | Specification Time for Length (L) (min.:sec.) | |
|---|---|---|---|---|---|
| | | | | 550 ft. | 600 ft. |
| 6 | 5:40 | 398 | 0.8548 | 7:50 | 8.33 |
| 8 | 7:33 | 298 | 1.5196 | 13:56 | 15:12 |
| 10 | 9:27 | 239 | 2.3743 | 21:46 | 23:45 |
| 12 | 11:20 | 199 | 3.4190 | 31:20 | 34:11 |
| 15 | 14:10 | 159 | 5.3423 | 48:58 | 53:25 |
| 18 | 17:00 | 133 | 7.6928 | 70:31 | 76:56 |
| 21 | 19:50 | 114 | 10.4708 | 95:59 | 104:42 |
| 24 | 22:40 | 99 | 13.6762 | 125:22 | 136:46 |
| 27 | 25:30 | 88 | 17.3089 | 158:40 | 173:05 |
| 30 | 28:20 | 80 | 21.3690 | 195:53 | 213:41 |
| 33 | 31:10 | 72 | 25.8565 | 237:01 | 258:34 |

4.3.4. **Leakage Testing for Manholes**. After completing manhole construction, wall sealing, or rehabilitation, but before backfilling, test manholes for water tightness using vacuum or hydrostatic testing procedures as described in Section 4.3.4.1., “Vacuum Testing,” and Section 4.3.4.2., “Hydrostatic Exfiltration Testing.”

Plug influent and effluent lines, including service lines, with suitably sized pneumatic or mechanical plugs. Use plugs that are properly rated for the pressures required for the test. Adhere to the manufacturer’s safety

and installation recommendations. Place plugs at least 6 in. outside manhole walls. Brace the inverts to prevent lines from dislodging if lines entering the manhole have not been backfilled.

4.3.4.1. **Vacuum Testing**. Install the vacuum tester head assembly at the top access point of the manhole and adjust it for a proper seal on the straight top section of the manhole structure. Following the manufacturer's instructions and safety precautions, inflate the sealing element to the recommended maximum inflation pressure. Do not over-inflate the sealing element.

Evacuate the manhole with a vacuum pump to 10 in. of mercury (Hg). Then disconnect the pump and monitor the vacuum for the time specified in Table 6.

**Table 6**
**Vacuum Test Timetable**

| Depth (ft.) | Time in Seconds, by Pipe Diameter | | |
|---|---|---|---|
| | 48 in. | 60 in. | 72 in. |
| 4 | 10 | 13 | 16 |
| 8 | 20 | 26 | 32 |
| 12 | 30 | 39 | 48 |
| 16 | 40 | 52 | 64 |
| 20 | 50 | 65 | 80 |
| 24 | 60 | 78 | 96 |
| See note[1] | 5.0 | 6.5 | 8.0 |

1. Add T times for each additional 2-ft. depth. (The values listed above were extrapolated from ASTM C924-85.)

If the drop in vacuum exceeds 1 in. of Hg over the specified time in Table 6, locate the leaks, complete repairs necessary to seal the manhole, and repeat the test procedure until satisfactory results are obtained.

4.3.4.2. **Hydrostatic Exfiltration Testing**. Seal the wastewater lines entering the manhole with an internal pipe plug. Then fill the manhole with water, and maintain it full for at least 1 hr. The maximum leakage allowed for hydrostatic testing is 0.025 gal. per foot diameter per foot of manhole depth per hour.

If the water loss exceeds the amount in Table 6, locate the leaks, complete repairs necessary to seal the manhole, and repeat the test procedure until satisfactory results are obtained.

4.4. **Testing Procedures (Pressure or Force Main System)**. After each section of force main is completed and can be isolated so high pressure cannot force test water into the operating system, hydrostatically test it. Perform such testing in accordance with AWWA C 600-77, Section 4, as modified below.

- Flush the test section with open bleeds with the flow controlled at the feed from the operating system so that the flushing pressure is always well below that of the operating system.
- Momentarily pressurize the pipe to 160 psi as a "burst" test. Conduct the leak test at 140-psi pressure.
- Pipe installations exceeding the leakage determined by the following formula will not be accepted:

$$L = \frac{(S)\,(D)\,(P)^{0.5}}{133{,}200}$$

in which (L) is the allowable leakage in gallons per hour; (S) is the length of pipe in feet; (D) is the nominal ID of the pipe in inches; and (P) is the average test pressure during the leakage test, in pounds per square inch gauge.

- After removing temporary inserts installed for hydrostatic testing, and before backfilling, leave the replacement piping exposed for visual inspection for leakage under normal pressure (after disinfection).

4.5. **Deflection Test of Thermoplastic Pipe (e.g., PVC)**. Thirty days after backfilling, test flexible pipe (e.g., PVC) lines for deflection by pulling a mandrel or an approved deflectometer through the line. Perform mandrel testing in accordance with ASTM D3034 or ASTM F794. Remove and reinstall sections indicating 5% deflection or more, then retest for leakage and deflection. Mandrel testing is not required for stubs.

4.6. **Defective Sewers**. Remove sections of the sewer that show leakage exceeding that permitted by these Specifications and re-lay them or otherwise repair using approved methods and materials. Perform permanent-type repairs. Repair individual leaks that may appear whether the overall section meets the leakage requirements. Individual leaks ordinarily are revealed by looking through the sewer using a light when the groundwater level is over the sewer, or immediately after water from exfiltration tests is emptied from the sewer. Settlement in the backfill during exfiltration tests indicates leakage in the sewer.

4.7. **Retests**. After completing repairs, retest for leakage those sewers that failed to meet the requirements of the leak test.

4.8. **Responsibility of the Department**. The Engineer will observe the sanitary sewer construction and other contributing work, and will monitor the testing of this system for compliance with the plans and Specifications.

4.9. **Responsibilities of the Contractor**. Conduct tests and supply labor, materials, and equipment required to perform the tests described in this Specification.

## 5. MEASUREMENT

This Item will be measured as follows.

5.1. **Sanitary Sewers**. Sanitary sewers will be measured by the foot, of the various sizes, types, and wall thickness (if applicable), of sanitary sewer specified, tested, and accepted by the Engineer. Sanitary sewer will be measured longitudinally along the centerline of the sewer between the inside faces of the manholes.

If the installation involves a connection to an existing sewer line, the measurement will be made from the end of the existing sewer line to the inside face of the manhole on the work being measured.

Sanitary sewer pipe will be measured as described above and classified as sanitary sewers for the purposes of payment.

Wyes, tees, and bends are considered part of this Item. Include them in the measurement for payment of pipe sewer main in which they are installed. Plugs are considered part of the pertinent bid items.

5.2. **Steel Casing**. Steel casing will be measured by the foot of the various sizes installed by the open-cut method accepted by the Engineer. Steel casing will be measured longitudinally along the centerline of the casing pipe. The conditions and Specifications regarding the measurement of sanitary sewers stated in Section 5.1., “Sanitary Sewers,” also apply to casing pipe.

5.3. **Manholes**. Manholes will be measured by each manhole, of the various types specified.

5.4. **Adjusting Manholes**. Adjusting manholes will be measured by each manhole adjusted.

5.5. **Jacking, Boring, or Tunneling**. Jacking, boring, or tunneling for sanitary sewers and steel casing will be measured by the foot of the various sizes, types, and wall thickness (if applicable) specified of sanitary sewer or steel casing jacked, bored, or tunneled.

5.6. **Service Connections**. Service connections will be measured by each complete disconnection (abandoned connection) or reconnection of the material, type, diameter, and depth range (0 ft.–10 ft., 10 ft.–15 ft., or greater than 15 ft.) specified for each sanitary sewer service. The depth will be measured from the natural ground level to the flow line of the sanitary sewer main at the point of reconnection, for the Contractor’s information only. One or more connections discharging into a common point will be considered one service connection.

5.7. **Abandoning Sanitary Sewers**. Abandoning sanitary sewers will be measured by each sewer abandoned of the sizes specified.

5.8. **Cutting and Restoring Pavement**. Cutting and restoring pavement will be measured by the square yard, of the depths specified.

5.9. **Air Release and Vacuum Relief Valves**. Air release and vacuum relief valves will be measured by each valve assembly installed of the various sizes and types specified.

## 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 the items described in the following Sections. These prices are full compensation for furnishing materials and their preparation; for excavation and backfill; for preparation, shaping, and fine-grading the bottom of the trench; for cutting and restoring existing pavement; for hauling, placing, and joining of pipes, valves, and fittings; for constructing bollards, vent piping, stacks, and manholes; and for necessary appurtenances and other items of materials, labor, equipment, tools, and incidentals.

6.1. **Sanitary Sewers**. Payment for sanitary sewers will be made at the unit price bid for "Sanitary Sewers" of the various sizes, types, and wall thickness (if applicable) specified, complete in place. Plastic liner is required for concrete pipe interior surfaces and will be subsidiary to this bid item. An internal liner resin is required for centrifugally cast fiberglass pipe and will be subsidiary to this bid item.

Unless otherwise specified on the plans or in this Specification, excavation, disposing of unsuitable excavated material, backfilling, and the material used for backfill for the complete installation of the sanitary sewer system will be subsidiary to and included in the unit price bid for the pipe and any structure for which payment is required.

Fittings, including necessary concrete blocking, pipe clamps, nipples, pipe coatings, and lubricants, will be subsidiary to the sanitary sewer mains in which they are installed. If additional fittings are required due to plan changes or alterations in line or grade, they will be subsidiary to the sanitary sewer lines in which they are installed.

6.2. **Steel Casing**. Payment for steel casing will be made at the unit price bid for "Casing (Steel) (Sanitary Sewer)" of the various sizes specified, installed by the open-cut method, complete in place.

6.3. **Manholes**. Payment for manholes will be made at the unit price bid for "Manholes (Sanitary Sewer)" of the various types specified, complete in place. Rings, covers, and steps will be subsidiary to this bid item.

6.4. **Adjusting Manholes**. Payment for each manhole adjusted will be made at the unit price bid for "Adjusting Manholes (Sanitary Sewer)." The excavation and backfill required will be subsidiary to this bid item.

6.5. **Jacking, Boring, or Tunneling**. Payment for jacking, boring, or tunneling of sanitary sewer will be made at the unit price bid for "Jacking, Boring, or Tunneling (Sanitary Sewer)" of the various sizes, types, and wall thicknesses (if applicable) specified. This price includes furnishing the pipe.

Payment for jacking, boring, or tunneling steel casing will be made at the unit price bid for "Jacking, Boring, or Tunneling Casing (Steel) (Sanitary Sewer)" of the various sizes and wall thickness specified (applicable only if exceeding minimum thickness shown in Section 2.8., "Steel Casing Pipe"). This price includes the steel casing.

Sanitary sewer placed in casing will be paid for at the unit price bid for "Sanitary Sewers" as described in Section 6.1., "Sanitary Sewers."

Excavating; backfilling; backfill material; and disposing of the unsuitable excavated material caused by jacking, boring, or tunneling pipe or casing will be subsidiary to and included in the unit price bid for the pipe or casing jacked, bored, or tunneled.

6.6. **Service Connections**. Payment for service connections will be made at the unit price bid for "Service Connections (Sanitary Sewer)." This payment includes any sewer stacks required. Excavation and backfill associated with disconnection or reconnection will be subsidiary to this bid item.

No separate payment will be made for an abandoned service connection if the service to be abandoned is within 4 ft. of an active connection. Payment for one abandoned service connection will be allowed when a second abandoned connection is within 4 ft. of the first.

6.7. **Abandoning Sanitary Sewers**. Payment for abandoning sanitary sewer will be made at the unit price bid for "Abandoning Sanitary Sewer" of the sizes specified. Excavation and backfill required to abandon the sanitary sewer will be subsidiary to this bid item. Where grout is required, as shown on the plans, it will be subsidiary to this bid item.

6.8. **Cutting and Restoring Pavement**. Payment for cutting and restoring pavement will be made at the unit price bid for "Cutting and Restoring Pavement" of the depths specified. Excavation below the pavement and base will be subsidiary to this bid item.

6.9. **Air Release and Vacuum Relief Valves**. Payment for air release and vacuum relief valves will be made at the unit price bid for "Air Release Valve," "Air Release and Vacuum Relief Valve," or "Vacuum Relief Valve" of the various sizes specified. This price is full compensation for valves, fittings, vent piping, bollards, necessary appurtenances, and incidentals.

Trench excavation protection or temporary special shoring required for trenches that are greater than 5 ft. in depth and sloping the sides of those trenches to preclude collapse will be measured and paid for as required by Item 402 or Item 403.

Furnishing and placing bedding material will be subsidiary to the pertinent bid items.

Furnishing and installing a complete, operational nonmetallic pipe detection system, and the materials necessary for this system, will be subsidiary to the pertinent bid items.

Unless otherwise specified on the plans, repair curbs, pavement, base material, concrete riprap, and sidewalks damaged by construction operations at no expense to the Department, if such damaged items are not part of the Contract.

Testing sanitary sewers for leakage, including labor, materials, and equipment necessary to perform the tests, will be subsidiary to the pertinent bid items.