Texas Department of Transportation

TECHNICAL PROVISIONS

FOR THE

SH 360 PROJECT

A Design-Build Project

Request for Proposals

Addendum #2

November 24, 2014

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Attachment 21-1 – Toll Facility Responsibilities Matrix

1 GENERAL

1.1 Project Description

The Project generally consists of the design, construction and, at TxDOT's election, maintenance of approximately 9.3 miles of SH 360 toll lanes including frontage road and intersection improvements from just south of I-20 to US 287.

TxDOT has entered into a Project Development Agreement ("PDA") with the North Texas Tollway Authority (the "Authority") for the TxDOT DB Contractor to design, construct and potentially maintain the Project upon Substantial Completion. DB Contractor will also be responsible for operating and maintaining the Project until Substantial Completion.

The Project is the initial phase of the ultimate project described in the SH 360 Finding of No Significant Impact (FONSI), authorized on January 16, 2014. The Project base scope schematic ("Base Scope Schematic") and the Ultimate Schematic are both contained in the Reference Information Documents (RID).

1.2 Project Scope

The Work consists of the design and construction of a Base Scope consisting of two tolled mainlanes lanes in each direction from approximately E. Sublett Road/Camp Wisdom Road to E. Broad Street and one toll lane in each direction with periodic passing lanes from E. Broad Street to north of Matlock Road.

The Base Scope shall also include construction of portions of new frontage roads and improvements to existing frontage roads to provide continuous northbound and southbound frontage roads from approximately E. Sublett Road/Camp Wisdom Road to US 287 including construction of a SH 360 southbound to northbound frontage road turnaround and frontage road box at US 287.

Work shall include, but is not limited to, design and construction of roadway, drainage, bridge structures, retaining walls, noise barriers, signing, lighting, tolling infrastructure, and traffic signals along SH 360 toll lanes, frontage roads, and cross streets as shown in the Schematic Design.

The Work may also be supplemented, at TxDOT's sole discretion, to include Option Work as described below.

The Work shall be in general conformance with the line and grade shown on the Base Scope Schematic (Initial Design Schematic dated October 2014) and Option Work Exhibits contained in the RID. Any material change to the Project Elements listed as Basic Configuration in Exhibit 1 to the DBA must be submitted for TxDOT review and written approval prior to submission of a proposal.

In addition, any material change to the mainlane, frontage road and cross street horizontal alignments, typical sections, and any change to the horizontal offsets from the Project centerline alignment to the inside edge of pavement of the northbound mainlanes and southbound mainlanes, respectively, as depicted on the Base Scope Schematic and more particularly described below in Table 1-1, must be submitted for TxDOT review and prior written approval.

Table 1-1: Offset from Mainlane Centerline to Edge of Pavement

Base Scope Schematic Mainlane Station		Offset from Mainlane Centerline to EOP (ft)	
From	**To**	**Southbound Mainlane (SBML)**	**Northbound Mainlane (NBML)**
736+90	791+04.57	24	24
791+04.57	813+78.58	24	36
813+78.58	877+33.55	36	36
877+33.55	886+22	36	24
886+22	1095+00	24	24
1095+00	1100+00	24	24
1100+00	1120+80	24	Match existing
1120+80	1130+00	24	36
1130+00	1175+00	36	36
1175+00	1182+00	END SBML	36
1182+00			END NBML

The approximate limits of the Work for the mainlanes and frontage road lanes and other Project improvements shall be as shown on the Base Scope Schematic and Option Work Exhibits.

1.2.1 Base Scope

1.2.1.1 Mainlanes

The mainlanes shall consist of two toll lanes in each direction from approximately E. Sublett Road/Camp Wisdom Road to E. Broad Street and one toll lane in each direction with periodic passing lanes, constructed on two road beds, from E. Broad Street to north of Matlock Road as shown on the Base Scope Schematic.

The mainlanes shall begin at approximately mainlane station 736+90 and terminate at approximately mainlane station 1175+00. Mainlane transition ramps to the SH 360 frontage roads shall be provided at approximately mainlane station 1175+00 to provide access to US 287.

SH 360 mainlane bridges shall be constructed at the following locations:

- SH 360 mainlanes over New York Avenue
- SH 360 mainlanes over stream crossing south of New York Avenue (Bowman Branch)
- SH 360 mainlanes over Walnut Creek
- SH 360 mainlanes over Lone Star Road

1.2.1.2 Frontage Roads

Frontage road work shall consist of the repair, reconstruction, widening and resurfacing of existing frontage roads, within the approximate limits depicted on the Base Scope Schematic, and construction of new portions of frontage roads and other frontage road work listed below:

- New SH 360 Frontage Roads
  - Southbound between Heritage Parkway and Lone Star Road
  - Southbound between Matlock Road and US 287
  - Northbound between Heritage Parkway and US 287
- SH 360 Frontage Road Widenings and Reconstruction
  - Northbound Reconstruction
    - Northbound from Holland Road to approximately 600 feet south of E. Broad Street
  - Northbound Widening
    - Between Ramp Lynn Creek-North and Camp Wisdom Road to accommodate left-turn lane
    - Between Ramp South-Lynn Creek and Lynn Creek Parkway to accommodate left turn lane
    - South of New York Avenue to accommodate right turn lane
    - Between Ragland Road/Debbie Lane and Ramp South-New York to accommodate a third through lane
    - North of Ragland Road/Debbie Lane to accommodate acceleration lane and taper
    - South of Ragland Road/Debbie Lane to accommodate right turn lane
    - South of Ragland Road/Debbie Lane to accommodate left turn lane
    - North of Holland Road to accommodate right turn lane
    - South of Holland Road to accommodate right turn lane
  - Southbound
    - North of New York Avenue to accommodate right turn lane
    - North of Ragland Road/Debbie Lane to accommodate right turn lane
    - North of Lone Star Road to accommodate right turn lane
    - North of Lone Star Road to accommodate left turn lane
  - Northbound US 287 mainlanes, east of SH 360 northbound frontage road, to accommodate right turn lane
- Frontage Road Auxiliary Lanes
  - Northbound

        - Between Ramp Debbie/Ragland-North and Ramp South-New York
        - Between Ramp Holland-North and Ramp South-Debbie/Ragland
        - Between Ramp Heritage-North and Ramp South-Broad/Holland
    - Southbound
        - Between Ramp North-Debbie/Ragland and Ramp New York-South
        - Between Ramp North-Holland and Ramp Debbie/Ragland-South
        - Between Ramp North-Heritage and Ramp Broad/Holland-South

1.2.1.3 Ramps

Ramps shall be provided at the following locations:

- Northbound
    - Entrance from Lynn Creek Parkway/Webb Lynn Road (Ramp Lynn Creek-North)
    - Exit to E. Sublett/Camp Wisdom Road (Ramp South-Sublett/Camp Wisdom)
    - Exit to Lynn Creek Parkway/Webb Lynn Road (Ramp South-Lynn Creek)
    - Entrance from Ragland Road/Debbie Lane (Ramp Debbie/Ragland-North)
    - Exit to New York Avenue (Ramp South-New York)
    - Entrance from Holland Drive (Ramp Holland-North)
    - Exit to Ragland Road/Debbie Lane (Ramp South-Debbie/Ragland)
    - Entrance from Heritage Parkway (Ramp Heritage-North)
    - Exit to E. Broad Street (Ramp South-Broad/Holland)
    - Exit to Heritage Parkway (Ramp South-Heritage)
    - Transition from northbound frontage road north of Matlock Road to northbound mainlanes (Northbound Transition-1)
- Southbound
    - Exit to Lynn Creek Parkway/Webb Lynn Road (Ramp North-Lynn Creek)
    - Entrance from E. Sublett/Camp Wisdom Road (Ramp Sublett/Camp Wisdom-South)
    - Entrance from Lynn Creek Parkway/Webb Lynn Road (Ramp Lynn Creek-South)
    - Exit to Ragland Road/Debbie Lane (Ramp North-Debbie/Ragland)
    - Entrance from New York Avenue (Ramp New York-South)
    - Exit to Holland Drive (Ramp North-Holland)
    - Entrance from Ragland Road/Debbie Lane (Ramp Debbie/Ragland-South)
    - Exit to E. Broad Street (Ramp North-Broad)
    - Exit to Heritage Parkway (Ramp North-Heritage)

- Entrance from E. Broad Street (Ramp Broad/Holland-South)
- Entrance from Heritage Parkway (Ramp Heritage-South)
- Exit to Lone Star Road (Ramp North-Lone Star)
- Transition from southbound mainlanes north of Matlock Road to southbound frontage road (Southbound Transition-1)

Southbound exit ramp to Ragland Road/Debbie Lane (Ramp North-Debbie/Ragland) includes a bridge structure over Bowman Branch.

1.2.1.4 Cross Streets

Intersection improvements shall be provided at the following cross streets to accommodate the intended operational characteristics shown on the Base Scope Schematic:

- E. Sublett Road/Camp Wisdom Road
- Lynn Creek Parkway/Webb Lynn Road
- New York Avenue
- Ragland Road/Debbie Lane
- Holland Road
- E. Broad Street
- Heritage Parkway
- Lone Star Road
- Matlock Road
- SH 360 Frontage Road connections at Eastbound and Westbound US 287

Cross street bridges shall be provided at the following locations:

- E. Sublett Road/Camp Wisdom Road over SH 360 mainlanes
- Lynn Creek Parkway/Webb Lynn Road over SH 360 mainlanes
- Ragland Road/Debbie Lane over SH 360 mainlanes
- Holland Drive over SH 360 mainlanes
- E. Broad Street over SH 360 mainlanes
- Heritage Parkway over SH 360 mainlanes

1.2.1.5 Frontage Road Turnarounds

- Lynn Creek Parkway/Webb Lynn Road
  - Southbound to northbound (turnaround bridge over SH 360)
- New York Avenue
  - Southbound to northbound (at-grade)
  - Northbound to southbound (at-grade)
- US 287

- Southbound to northbound (at-grade)

1.2.1.6 Toll Zones

Toll Zones shall be located as follows:

- Mainlane Toll Zones
  - North of New York Avenue approximately at mainlane station 831+40
  - South of Union Pacific Railroad (UPRR) approximately at mainlane station 1114+00
- Ramp Toll Zones
  - Northbound
    - Entrance from Lynn Creek Parkway/Webb Lynn Road (Ramp Lynn Creek-North)
    - Exit to New York Avenue (Ramp South-New York)
    - Exit to Ragland Road/Debbie Lane (Ramp South-Debbie/Ragland)
  - Southbound
    - Exit to Lynn Creek Parkway/Webb Lynn Road (Ramp North-Lynn Creek)
    - Entrance from New York Avenue (Ramp New York-South)
    - Entrance from Ragland Road/Debbie Lane (Ramp Debbie/Ragland-South)

1.2.1.7 Removals

The Work shall include all existing SH 360 pavement removals indicated on the Base Scope Schematic including but not limited to the following and to the extent necessary to accommodate the proposed improvements:

- Cross street pavement
- Turnarounds at New York Avenue
- Frontage road stubouts
- Transition pavement between existing mainlanes and Lone Star Road
- Southbound SH 360 frontage road pavement from Matlock Road to US 287

1.2.1.8 UPRR Underpass

An existing SH 360 underpass of the Union Pacific Railroad (UPRR) is located at approximately mainlane STA 1106+25. The proposed underpass shall consist of widening the southbound mainlanes and adding new northbound and southbound frontage roads including retaining walls, as shown on the Base Scope Schematic.

1.2.1.9 Noise Barriers

DB Contractor shall design and construct four noise barriers at the approximate locations provided below in Table 1-2, between the frontage roads and ROW, as described in Table 7-26 of the SH 360 Environmental Assessment FONSI dated January 16, 2014.

DB Contractor shall determine final placement of noise barriers and ensure that sufficient access is provided for construction and maintenance of the noise barrier. Noise barrier system designs showing final placement of the barriers shall be submitted to TxDOT for review and approval.

Table 1-2: Noise Barrier Locations

Noise Barrier	Receiver	Location
Noise Barrier 1	R1	Along east ROW line from approximately 940 feet north of Equestrian Lane to approximately 670 feet north of Sutton Drive
Noise Barrier 2	R2	Along west ROW line from Portland Drive to approximately 251 feet south of Edinburgh Street
Noise Barrier 3	R6	Along west ROW line from Webb Lynn Road to approximately 400 feet south of Port Phillips Drive
Noise Barrier 4	R12	Along west ROW line from Webb Ferrell Road to approximately 290 feet south of Weeping Willow Lane

1.2.1.10 Tarrant Regional Water District Design Requirements

The following specifications for roadway crossings of Tarrant County Regional Water District (TRWD) Right-of Way shall be incorporated into the design:

- Install a minimum of 18 inches of non-cohesive material at or below existing natural grade.
- Adjacent grading should promote runoff to be directed toward or over the non-cohesive materials to promote saturation.
- Size of the material used will be up to the designer.
- A minimum percolation rate of 0.5 inches per hour in dry material is required.

The cathodic protection system requires moisture to function properly and any proposed road crossing should be such to help enhance moisture reaching the surrounding bedding.

Temporary and permanent crossing details, providing different levels of protection for pipelines within TRWD ROW, ranging from protection of the existing cover over the pipes for HS-20 loads to bridging the pipes for loads exceeding HS-20 loads are provided in the RID document entitled "Technical Memo for the Evaluation of East Texas Pipeline Crossings." All vehicle and equipment loading must be analyzed in accordance with the memo guidelines and submitted for TRWD review. A checklist is also included in the memo to assist in the design of the crossings.

1.2.2 Option Work

TxDOT may also potentially add one or more of the following scope components to the Project as Option Work. Proposer shall include prices in its Proposal for each of the Option Work components described below.

All Option Work shall be in general conformance with the line and grade as shown on the Option Work Exhibits provided in the RID. In addition, any change to the horizontal alignments and typical sections as

depicted on the Option Work Exhibits must be submitted for TxDOT review and prior written approval. The approximate limits of the Option Work components shall be as shown on the Option Work Exhibits.

1.2.2.1 Option 1

Option 1 consists of extending two toll lanes in each direction from E. Broad Street to south of Matlock Road. Option 1 includes grade separating the SH 360 toll lanes at Matlock Road and providing ramp connections from the mainlanes to the frontage roads south of Matlock Road to access US 287 as shown on the Option 1 exhibit (2 + 2 to US 287 including Matlock Rd Overpass) provided in the RID. The approximate limits of the additional Work shall be as shown on the Option 1 exhibit.

1.2.2.2 Option 2

Option 2 consists of constructing new US 287 eastbound and westbound mainlane bridges over the SH 360 frontage road box, construction of a portion of new US 287 westbound frontage road and transition ramps to tie back to the existing US 287 mainlanes, as shown on the Option 2 exhibit (US 287 – Mainlane Grade Separation).

1.2.2.3 Option 3

Option 3 consists of completing the cross street structures, roadways, turnarounds and associated intersection improvements at the locations listed below, as shown on the Option 3 exhibits. The Option 3 work shall be in general conformance with the line and grade of the cross streets as shown on the Ultimate Schematic. Any change to the horizontal alignments and typical sections of the cross streets as shown on the Ultimate Schematic must be submitted for TxDOT review and prior written approval.

- Option 3A: E. Sublett Road/Camp Wisdom Road
- Option 3B: Webb Lynn/Lynn Creek Parkway
- Option 3C: New York Avenue
- Option 3D: Debbie Lane/Ragland Road
- Option 3E: Holland Road
- Option 3F: E. Broad Street
- Option 3G: Heritage Parkway
- Option 3H: Lone Star Road
- Option 3I: Matlock Road

1.2.2.4 Authority Options

The following Authority design standards shall be individually priced in the Proposal for both the Base Scope and Option Work components, as specified in Table 1-3 below:

- Authority Option 1: Communication Infrastructure Dynamic Message Sign (ITS-007-2008)
- Authority Option 2: Fence (RFD-002-2007 and RFD-003-2005)
- Authority Option 3: Aesthetics Uncoated Finish (SS 850) (Natural Grey Concrete)
- Authority Option 4: Pavement Concrete Pavement Junctures (CPJ-201-2012)
- Authority Option 5: Drainage Pavement Underdrain details (DRA-007-2007)
- Authority Option 6: Sand stockpile (SSP-001-2011)

Table 1-3: Authority Options

Authority Options	Base Scope	Option 1	Option 2	Option 3*
Authority Option 1		N/A	N/A	N/A
Authority Option 2			N/A	N/A
Authority Option 3			N/A	
Authority Option 4			N/A	
Authority Option 5			N/A	N/A
Authority Option 6		N/A	N/A	N/A

* Authority Option 3 and 4 shall be priced for each of the cross street options (Options 3A-3I)

1.3 Compatibility with Existing Configuration

The design documents furnished by the DB Contractor shall provide for a smooth transition from the Project's scope of Work, including any Option Work TxDOT may elect to exercise, to the existing configuration. DB Contractor shall coordinate with adjacent contractors, UPRR and property owners along SH 360 and US 287 to assure a seamless transition from proposed roadway to existing roadway conditions at all times. DB Contractor shall be responsible for removal of any temporary transitions which are not intended to accommodate permanent traffic operations connecting the proposed improvements to existing roadways. DB Contractor shall also provide for minimal disruption to traffic operations and adjacent property access throughout the performance of the Work.

1.4 Compatibility with the Ultimate Project

DB Contractor's Work, including any Option Work, shall accommodate and be consistent with the improvements associated with the Ultimate Project configuration.

DB Contractor shall ensure that any utilities that require relocation or adjustment to accommodate the Project Work shall also accommodate the Ultimate Project configuration to the greatest extent possible within Schematic ROW.

The design documents furnished by DB Contractor shall be consistent and compatible with the improvements associated with the Ultimate Project and provide for a smooth transition from the Project's Work including any Option Work to the Project's Ultimate Project configuration.

DB Contractor shall minimize "throwaway" costs associated with improving the Project to meet the requirements of the future ultimate scope configuration. The Work shall provide for minimal disruption to traffic and toll collection operations during the ultimate scope construction phase.

DB Contractor shall design and construct the cross streets to allow for future construction of the cross street ultimate configurations described in Attachment 11-2 to these Technical Provisions.

Noise barriers shall also be designed and constructed to accommodate the Ultimate Project configuration.

Additionally, the Project scope of work shall be designed and built to minimize the cost associated with the future ultimate scope construction to the extent that DB Contractor costs to construct the Work is not unreasonably increased.

1.5 Applicable Standards

The design and construction of the Project including all Utility Adjustment Work shall be consistent with TxDOT standards and specifications as referenced in these technical provisions and shall be

supplemented by the Authority's standards listed below. In the event of any conflict between TxDOT's standards and the Authority's standards and equipment specifications listed below, the Authority's standards below shall control.

1.5.1 Authority Standards

1.5.1.1 Striping

Authority striping standard (MRK-001-2004, FPM (1thru 4)-12 (MOD))

1.5.1.2 Rail

Single Slope Concrete Barrier (SSCB(2)-10 (Mod))
Single Slope Transition SSB to SSTR (SST-210-2010)
Authority Standard for Delineation (LDS-201-2009)

1.5.1.3 Signage

Bridge Mounted Clearance Sign Assembly (BCS-001-2007)
Sign Details (SGN-005-2009, SGN-004(1)-2012, SGN-004(2)-2012)
Station Marker Details (SGN-003-2004)
Typical Sign Requirements (TSR(1)-08 MOD)

1.5.1.4 Bridges

Bridge Approach Slab Supplement (BAS-201-2010)

1.5.1.5 Columns

Aesthetic Bent Guidelines Multi-Column Bent (ABG-201-2009)

1.5.1.6 Walls

Texture – Grande Flagstone
MSE Wall Underdrains (MSE-202-2009)
Retaining Wall Details (RWD-201-2010, RWD-202-2009, RWD-203-2009, RWD-204-2009, RWD-205-2009, RWD-207-2011)
Retaining Wall Guidelines (RWG-201-2010)
MSE Wall Design Requirements (MSE-201-2009)
Retaining Wall Details (RWD-207-2011)
Retaining Wall Rail (RWR-201-2009)

1.5.1.7 Lighting

Roadway Illumination Detail Steel Poles (RID-203-2011)
Roadway Illumination Details- Underpass mounting (RID-204-2011)
Bridge Lighting Details (BLD-201-2011)

1.5.1.8 Overhead Signs

Cantilever Overhead Sign Support (COS-001-2009, COS-002-2009, COS-003-2009)
Overhead Sign Bridge (OSB-001-2009, OSB-002-2007, OSB-003-2007)

1.5.1.9 Signage

Sign Mounting Detail (SMD-001-2010)

1.5.1.10 Drainage

Miscellaneous Drainage Details (DRA-005-2007)
MSE Wall Inlet (DRA-004-2007)
Drop Inlet Type C (DRA-003-2007)
Drop Inlet Type D (DRA-008-2007)

1.5.1.11 Riprap/Mowstrips

Concrete Riprap with Retaining Wall at Overpass Bridges (STR-001-2007)
Underbridge Riprap Detail (URD-201-2009)
Mowstrip (MSD-001-2007)

1.5.1.12 Gantries

Main Lane Gantry (MLG-001-2009, MLG-002-2008, MLG-003-2009, MLG-004-2009)
Ramp Gantry (RG-001-2009, RG-002-2008, RG-003-2009, RG-004-2009)
Main Lane Gantry Precast (MGP-002-2009)
Ramp Gantry Precast (RGP-002-2009)

1.5.1.13 Communication Infrastructure

Electrical Service Center (ESC-001-2009, ESC-002-2009, ESC-003-2009, ESC-004-2009, ESC-005-2009, ESC-006-2009)
Fiber Optic Cable (ITS-001-2009 and ITS-002-2009)
Communication Hut (ITS-003-2009)
CCTV Camera Pole Details (ITS-006-2009) or (ITS-008-2009)

1.5.1.14 Aesthetics

Rail-Mounted Fence (RMF-201-2010)
Recessed Logo Detail Retaining Wall Logo (LGO-201-2009)
Recessed Logo Detail Column Logo (LGO-202-2009)
Cross Street Identification Details (CSI-201-2009)

1.6 Design Visualization

DB Contractor shall provide three-dimensional design files to TxDOT for use during the design and construction process.

1.6.1 Services to be Provided by TxDOT

The type of available data may vary dependent on the level of project development. Typical types of data that TxDOT will provide to DB Contractor if available are:

a) Data that TxDOT has on file concerning the project, if available. Examples include as-built plans, field notes, etc.)
b) Electronic data of topography, roadway alignments and edge lines, pavement markings, criteria files, cross sections, and Digital Terrain Models (DTMs) that TxDOT or their consultant contractor have concerning the project.
c) Drawings, sketches, renderings or photographs of special design Elements such as, sidewalk paving materials, crosswalk details, and any architectural treatments, if available.
d) Elevation data that may be needed in some areas where the terrain changes abruptly and special design features are required, such as retaining walls or elevated structures.

1.6.2 Services to be Provided by DB Contractor

DB Contractor shall provide accurate three-dimensional models that depict the Project. Completed models will represent realism and aesthetic attributes of the existing conditions and the proposed Project. DB Contractor shall add roadway design details to the model that are not normally provided at the stage of Base Scope Schematic and verify that the Base Scope Schematic complies with design guidelines presented in the TxDOT Roadway Design Manual, Texas MUTCD, and the AASHTO Green Book.

The design visualization models shall show existing and proposed design conditions either separately or combined in the same display. Based on specific Project requirements the final design visualization deliverables may include photo-matched renderings, rendered plan view layouts, and animated sequences.

DB Contractor shall provide, along with the Record Drawings, a three dimensional CADD model of the completed Project and any work product generated during the modeling process, such as site photographs, textures, material assignments, and additional terrain information. All CADD data should be in electronic format and native to TxDOT's CADD architecture using Bentley Systems, Inc. MicroStation to provide complete compatibility between the DB Contractor and TxDOT.

DB Contractor shall collect, review, and evaluate all of the available existing data pertaining to the Project and prepare the design visualization models to reflect current design requirements. The data shall include MicroStation design files, GEOPAK geometry files, existing terrain models, and digital ortho photography. DB Contractor shall field verify the existing and proposed condition of design visualization models for dimensional accuracy and realism.

1.6.3 Design Visualization Services – Photo Rendering and Exhibits

DB Contractor shall provide photo renderings of no more than ten (10) locations to be determined by TxDOT.

DB Contractor shall coordinate with TxDOT the location of the photographs. DB Contractor shall take a minimum of two existing condition photographs at each of the ten (10) locations. These photographs will serve as the basis for the photo-renderings.

DB Contractor shall provide two (2) mounted "before" images and two (2) mounted "after" static 3-D photo matched images of proposed design Elements at each of the ten (10) locations.

The computer model shall accurately depict the geometric design of the proposed improvements at each of the ten (10) locations that would cover the limits of the existing condition photographs. Engineering judgment will be used for definition of slope, retaining wall, bridge abutment placement, and other physical features that may not be readily apparent from the design schematic. The computer model is intended to be used by TxDOT for public information purposes.

All CADD work and resulting data shall duplicate TxDOT's existing CADD architecture to ensure total compatibility. This data shall be delivered in native format using Bentley Systems, Inc. MicroStation and GEOPAK or match present versions in use by TxDOT. Specific TxDOT data/configuration for GEOPAK and geometric design shall be used. Resulting animations for design visualization purposes do not have to be native MicroStation, but do need to be capable of viewing on any device with minimal support or effort by the end user.

1.6.4 Design Visualization Services – 3-D Computer Model

1.6.4.1 General Requirements

Utilization of three dimensional (3-D) Design is an integral part of the performance of the Project prior to and during construction and throughout the Project's service life. Additionally, the implementation of 3-D Design techniques is intended to improve quality, reduce risk, improve collaboration with project stakeholders, provide an early focus toward technical review, and increase opportunity for innovation.

DB Contractor shall prepare topographically accurate 3-D computer models for ten (10) locations.
The computer model shall accurately depict the geometric design of the proposed improvements at each of the ten (10) locations and associated interchanges. Engineering judgment will be used for definition of

slope, retaining wall, bridge abutment placement, and other physical features that may not be readily apparent from the design schematic. The computer model will also incorporate existing features in the corridor out to a distance of approximately 500-feet either side of the roadway centerline, but up to 750 feet as needed.

All CADD work and resulting data shall duplicate TxDOT's existing CADD architecture to ensure total compatibility. This data shall be delivered in native format using Bentley Systems, Inc. MicroStation and GEOPAK or match present versions in use by TxDOT. Specific TxDOT data/configuration for GEOPAK and geometric design shall be used. Resulting animations for design visualization purposes do not have to be native MicroStation, but do need to be capable of viewing on any device with minimal support or effort by the end user.

1.6.4.2 Design Requirements

DB Contractor shall utilize 3-D methodologies and techniques to incorporate the Project Schematic into DB Contractor's project integrated design files. DB Contractor's 3-D Design shall facilitate the coordination and accommodation of the Ultimate Project configuration and any asset management considerations as it relates to operations and maintenance.

DB Contractor shall create an integrated-model of the existing condition utilizing 3-D methodologies and techniques. The existing condition model shall include existing ground surface and certain subsurface Elements (including, at a minimum: drainage structures, bridge and wall foundations, and utilities) features utilizing data from light detection and ranging (LiDAR), Sub-surface Utility Evaluation (SUE), field surveys, and existing plans data collection; including currently available LiDAR or other existing ground surface data (.dtm or .tin format) provided by TxDOT.

DB Contractor shall utilize 3-D methodologies and techniques to develop the geometric design and the 3-D Design model for each proposed roadway and incorporate it into the Project's integrated design models.

All geometric design shall be prepared in accordance with these Technical Provisions:

a) Refine and finalize horizontal and vertical alignments for all collector-distributors, frontage roads, ramps, direct connectors, cross roads, pavement transitions and tie-ins to existing lanes.
b) Determine horizontal and vertical clearances at grade separations, underpasses, and overpasses.
c) Develop superelevation and superelevation transition designs for each roadway. Verify rollover constraints are adequately addressed: including ramp, collector-distributor, and direct connector gore locations.
d) Integrated design model deliverables shall consist of 3-D MicroStation file(s) containing 3-D graphical Elements (components, contours, superelevation transitions limits, existing and proposed finish grade triangles) representative of the design model, and .dtm or .tin surface files.

DB Contractor shall include key existing and proposed 3-D Design features for the following Elements of the Work in accordance with the Technical Provisions:

a. Roadway (including, at a minimum: mainlane pavement and barrier walls, frontage road pavement, locations of ramps entering and exiting the mainlanes, and locations of ramps entering and existing the mainlanes to the frontage roads)
b. Drainage
c. Structures (including, at a minimum: sufficient detail to show top of deck surface, structure type, bottom of beam surface, and pier, abutment and retaining wall locations)
d. Utilities
e. Signing (including, at a minimum: overhead span or cantilever sign structure locations and structure type)

f. Lighting (including, at a minimum: pole and foundation locations)
g. Signals (including, at a minimum: controller, pole and foundation locations)
h. Toll Infrastructure (including, at a minimum: structure type; not to include detailed Elements related to toll gantries or Elements inside buildings).
i. Aesthetic concepts and Elements (including, at a minimum: form, shapes, scale, textures and colors)

1.6.5 Immersive 3-D Over the Shoulder Milestone Review Meetings

DB Contractor shall present the project 3-D Design model to TxDOT and stakeholders at review meetings. DB Contractor shall utilize software that allows for interactive visualization of the 3-D Design model key features. The 3-D Design model shall be completed to a sufficient level of detail that existing terrain, proposed design features, and existing infrastructure to remain in place can be viewed, analyzed and discussed among meeting participants. Immersive 3-D milestone review meetings shall occur prior to any design Submittals to TxDOT.

DB Contractor's 3-D Design model shall be capable of providing the following minimum functionality during the immersive 3-D milestone review meetings:

a. View the model and manipulate view settings to interactively change data display on screen (e.g. pan, rotate, walk, fly, zoom, etc.).
b. Measure distances and areas throughout all areas of the model.
c. Reference baseline geometry, stationing, and existing and proposed ROW.
d. Dynamically visualize key existing and proposed design features and detect conflicts/clashes amongst the following disciplines:

a) Roadway (including, at a minimum: tolled mainlane pavement and barrier walls, frontage road pavement, and locations of ramps entering and existing the tolled mainlanes to the frontage roads)
b) Drainage
c) Structures (including, at a minimum: sufficient detail to show top of deck surface, structure type, bottom of beam surface, and pier, abutment and retaining wall locations)
d) Utilities
e) Signing (including, at a minimum: overhead span or cantilever sign structure locations and structure type)
f) Lighting (including, at a minimum: pole and foundation locations)
g) Signals (including, at a minimum: controller, pole and foundation locations)
h) Toll infrastructure (including, at a minimum: structure type; not to include detailed Elements related to toll gantries or Elements inside buildings).
i) Aesthetic concepts and Elements (including, at a minimum: form, shapes, scale, textures and colors)
j) Sound walls (including aesthetic type, shape, scale, textures and colors)

1.7 Offices, Equipment and Vehicles

Except where noted elsewhere in the DBA Documents, DB Contractor and TxDOT shall co-locate for the term of the DBA Documents to facilitate Project coordination and daily communication. The definition of "co-locate" for the Term of the DBA is office space meeting the conditions of this Technical Provision that are within one (1) mile of the Project ROW, or as approved by TxDOT. At a minimum, the following DB Contractor's personnel shall be co-located with TxDOT:

a. Project Manager, Lead Quality Manager, Design Manager, senior design engineer, and at least one CADD technician during the design phase; and

b. Project Manager, Lead Quality Manager and Construction Manager during the construction phase.

DB Contractor shall provide TxDOT office space (i.e., available for occupancy) within thirty (30) days of issuance of Notice-to-Proceed 1 (NTP1). The location, condition, and amenities of the office space for TxDOT are subject to TxDOT's prior written approval. The office space requirements for the Project office are provided below.

1.7.1 Office Network and Systems

DB Contractor shall provide, furnish, install, operate, and maintain the following for the TxDOT office spaces:

- A local area network (LAN) with a minimum two (2) 100 megabits per second (Mbps) network drops for each personal office area and a minimum of four (4) 100 Mbps drops for each conference room. All drops shall have the ability to connect to the internet. The network shall allow for multiple virtual private network (VPN) connections/sessions. The network shall also provide full wireless ethernet (WiFi ®) coverage within the office. The wireless network shall be capable of 802.11 a/b/g/n;
- A touch-tone telephone system (with voice mail) with at least one (1) telephone, with speakers for each personal office area. Also provide at least one (1) telephone, with speakers and a minimum of one (1) satellite microphone for each conference room. The telephone system shall have the ability to host two (2) lines per telephone, access all outside lines, receive any incoming call, caller ID, conference-call capability (3-way calling), call forwarding, call transfer, hold, hold music, and send to voice mail functionality;
- Access to DB Contractor's EDMS systems for file sharing, collaboration, reviews, and responses at each personal office area and within each conference room;
- One computer with two flat panel monitors including all necessary peripherals for each personnel office area and the reception area in the Project office. Fifteen of these computers shall be laptops with docking stations;
- Peripherals shall include at minimum, monitor stand, docking station for laptop computers, mouse, keyboard, extra battery for laptop computers, wireless internet for laptop computers, and carry bag for laptop computers;
- Desktop computers specifications and operating systems shall generally be the same as those used by technical staff on DB Contractor's team;
- Laptops specifications and operating systems shall generally be the same as those used by the management staff on DB Contractor's team;
- Three iPhone 6s along with service (or latest version available) and protective case;
- Three iPad Air (latest version available) with Wi-Fi + Cellular, 64GB capacity along with 4G cellular service and protective case with key pad;
- Three GPS Cameras(to include compass / GPS module, 4GB SD card, camera bag, additional battery, USB cable, neck strap, rechargeable lithium-ion battery, battery charger, instruction manuals and warranty card);
- One Digital Video Camera;
- High speed, highly reliable internet service(s) capable of providing a minimum download speed of 2 Mbps and a minimum upload speed of 1 Mbps per network drop with a minimum of three (3)

concurrent download connections download and a minimum of two (2) concurrent upload connections;

- The ability to print to any printer from any network drop or wireless connection regardless of user domain. (I.e. TxDOT and others computers shall be able to print to any printer from any network drop.);
- Including all network equipment, racks, structured cabling, wall plates, jacks, patch panels, patch cords (including patch cables for each LAN and telephone drop in each personal office area and conference room, power assemblies and other appurtenances needed to meet the requirements contained within this Technical Provision;
- All hardware and software shall meet applicable industry standards and protocols;
- Provide on-site technical support eight (8) hours per day, five (5) days per week until the completion and close out of the Project;
- One (1) high-speed laser computer printer capable of handling 11 inches x17 inches prints;
- One (1) high-speed color printer capable of handling 11 inches x17 inches prints;
- One (1) high-speed color photocopy machine capable of handling 11 inches x17 inches prints;
- One (1) facsimile transmission machine;
- One (1) high-speed color scanner capable of handling 11 inches x17 inches prints;
- A multipurpose piece of equipment capable of meeting multiple parts of the requirements above will be considered to meet the requirements;
- All office supplies, including copier paper, toners, pens, pencils, notepads, and other miscellaneous office supplies;
- One hard copy of all TxDOT and AASHTO design manuals and standards as specified in the DBA Documents;
- Certify and state supplied components as functional before installation and will bear all responsibility for replacement of parts at work commencement; and
- Prepare test plan for all parts and components and submit before installation test installed system and supply test results, in conformance with industry standard testing procedures.

1.7.2 Project Office

DB Contractor shall provide all space, facilities, and support Elements necessary to design, construct, and maintain the TxDOT project office in accordance with the DBA Documents. DB Contractor shall provide office space, not less than 3,000 SF, for TxDOT's design and Project management staff, including, the General Engineering Consultant and other contract employees for a maximum of seventeen (17) persons. If it is necessary to locate any of these Elements of the Work off-site or outside of this office, DB Contractor shall obtain TxDOT's prior written consent.

DB Contractor shall provide a preliminary TxDOT facility area layout plan to TxDOT no later than seven (7) Days after NTP1. TxDOT will promptly review and comment on required modifications to the layout within ten (10) days. DB Contractor shall submit a final facility layout plan within ten (10) Days of receipt of TxDOT comments.

DB Contractor shall have the TxDOT facility area available for move-in and functional no later than thirty (30) days after issuance of NTP1.

1.7.2.1 TxDOT Facility Area and Items Provided by DB Contractor

DB Contractor shall provide separate office space for the exclusive use of TxDOT's design and Project management staff in the TxDOT facility area as specified herein and subject to TxDOT's prior written approval. This office space shall be located within the same building or complex as DB Contractor's office staff. TxDOT will be reasonable regarding re-use of existing space within DB Contractor's current office facility, provided that the space is contiguous and workable in TxDOT's sole discretion.

Office Condition. The offices shall be in good and serviceable condition, at least of the same quality as those of DB Contractor's counterpart office space, and available for occupancy as specified herein. Both Parties shall participate in a facility condition survey prior to and at the completion of occupancy. TxDOT shall return possession of DB Contractor-provided TxDOT facility area to DB Contractor in essentially the same condition as when TxDOT occupied the facilities, except for reasonable wear and tear and except for alterations, or loss or damage caused by any member of a DB Contractor-Related Entity.

Loss or Damage. If office spaces, related facilities or fixtures are destroyed, damaged or stolen during the Work, in the TxDOT facility area, except as a direct result of willful misconduct of TxDOT or its personnel, DB Contractor shall, at its cost and within ten (10) Business Days after the occurrence of such destruction or damage, repair those items to their original condition or replace them. However, in the case of lost, damaged, or stolen office equipment (e.g., computers, fax machines, copy machines, and printers) necessary for normal office operations, replacement shall occur within two (2) Business Days. If loss or damage is caused as a direct result of willful misconduct of TxDOT or its personnel, DB Contractor shall replace the facilities noted herein within the timeframes specified herein, and TxDOT shall reimburse DB Contractor for actual, reasonable, and documented costs incurred.

Office Facilities and Equipment. For the TxDOT facility area it provides, DB Contractor shall:

- General. Secure facility space, obtain all permits, install and pay for all utility services, and maintain the facilities as part of the Work;
- Access and Security. Provide separate TxDOT entrance/exit(s) from building, which shall be secured with electronic door lock(s) plus a deadbolt lock. DB Contractor shall provide security badge card access with locking doors running on time zone/holiday schedules for entry doors as well as other designated areas (e.g., network/telecommunications, document storage, offices). DB Contractor shall provide software for maintaining access to these areas, which will be owned and/or maintained by TxDOT's design and Project management staff;
- Lighting and Electricity. Include with all interior spaces overhead lighting meeting OSHA, building, and electrical and energy code requirements for similar office space (provide nominal 30 foot candles of light at 30 inches above finish floor). Each office space shall have at least four (4) duplex receptacles, with minimum circuit capacity of twenty (20) amperes. In addition, each personal office area and conference room shall have a 1500 Volt-ampere (VA) uninterruptible power supply (UPS). All LAN and Telephone system equipment and appurtenances shall have a UPS sized properly to be capable of providing up to one (1) hour of battery run time;
- Janitorial and Trash Services. Provide daily janitorial service (except Saturdays, Sundays and Holidays) and maintain trash containers and trash pickup service for the building and site areas beyond the TxDOT facility area. This shall include, but not be limited to, sweeping and mopping floors, cleaning restrooms and break room, emptying wastebaskets, and periodic dusting. This service shall be paid for by DB Contractor. DB Contractor shall pay for and procure janitorial services for the TxDOT facility area;

- Exterior Maintenance. Maintain the exterior areas of office spaces, including access to parking areas;
- Accessibility and Licensing. Meet all access requirements of the Texas Accessibility Standards, the Americans with Disabilities Act Accessibility Guidelines, as amended (42 USC §§12101, et seq.), and the applicable building code. Facility design plans shall be submitted to the Texas Department of Licensing and Regulation (TDLR) for review and approval as required by Section 16, Chapter 68 of the Texas Administration Code;
- Restrooms, Break Room, and Entry Space. Provide access to women's and men's restrooms, break room space, and building entry space. These spaces may be shared with DB Contractor's office space/staff. These spaces and all TxDOT spaces shall have access 24 hours per day, 7 days per week, and 365 days per year (24/7/365). In lieu of access to a common break room, DB Contractor may provide a 200 SF break room/kitchen within the TxDOT space, with refrigerator with freezer compartment, sink, and microwave. Break room/kitchen will have storage closet (25 SF) and cabinets with drawers and counter tops. In the event that access to restrooms cannot be accessed from a common building entry/lobby, DB Contractor may provide separate restrooms for the TxDOT facility area. In the event it is necessary to locate a separate break room and/or restrooms within the TxDOT facility area, the 3,000 SF TxDOT space allocation may be required to be increased to accommodate these spaces;
- HVAC. Provide electrical, heating, ventilation, and air conditioning (HVAC) systems capable of maintaining temperatures between 65 and 75 degrees Fahrenheit in all spaces, 24 hours per day, 7 days per week, and 365 days per year (24/7/365), through the year. Server room shall have dedicated air conditioning/cooling system capable of maintaining temperatures between 65 and 70 degrees Fahrenheit, and 15% relative humidity;
- Code Requirements. Meet all applicable building and fire code requirements; and
- Disposal and Removal. Be responsible for disposal or removal of all DB Contractor-provided facilities and any facility and/or site restoration Work as required.

Space Requirements. Although actual spaces may vary slightly, the following nominal size requirements will apply, and the typical TxDOT facility area shall include the following Elements:

- Offices. Enclosed offices for TxDOT's management staff (nominal 150 SF each), eleven (11) total with keyed door hardware;
- Cubicles. Cubicle area spaces for administration staff (nominal 64 SF each), six (6) total; (power supply and data and communication lines to cubicles may be provided through power pole drops);
- Conference Rooms. One (1) conference room at nominal 18 feet x 25 feet (450 SF). All shall have dimmable lighting; each conference room shall have one chair for every 24 SF of conference room space and a conference table of sufficient size for each chair;
- Reception Area. Receptionist space with waiting area with seating for four (4) visitors (nominal 200 SF); other furniture to be determined jointly by DB Contractor and TxDOT;
- Storage and Filing. One (1) lockable space for storage and filing, nominal 10 feet x15 feet (150 SF);
- Network/Telecommunications Room. One (1) network/telecommunications room sized appropriately to meet ADA, OSHA, and NEC requirements as applicable. Temperature shall be maintained with a dedicated HVAC as defined above;
- Parking Area. Parking area for at least twenty (20) vehicles (14 staff/6 visitors) that is reasonably level (all-weather surface and all-weather access);

- Exterior Lighting. Sufficient exterior security lighting that is automatically activated at low light levels to maintain two (2) foot-candles of lighting within the building and parking areas of the site; and
- Corridors. Corridors within the TxDOT facility shall have a nominal width of 54 inches.

Miscellaneous Requirements and Features. The following shall be provided as noted:

Flooring. Carpeted flooring (carpet not required in server room);

Entry Access. Entry to TxDOT areas by electronic door hardware card access (not keyed), with UPS on locks (fail closed);

Electrical Outlets. All data/voice outlets shall be installed next to power outlets;

HVAC. 24/7/365 HVAC as previously described;

Window Coverings. Horizontal mini-blinds (no drapes) for each exterior window;

Power Circuits. Provide dedicated electrical power circuits for copiers, and minimum of six (6) duplex receptacles with three (3) dedicated 20-amp circuits and one (1) 30-amp circuit for the server room;

Fire Extinguishers. DB Contractor shall provide fire extinguishers, per fire code and fire marshal with jurisdiction;

Insurance. Insurance (obtained and provided by DB Contractor) covering the use of the Project office by DB Contractor and TxDOT, in accordance with the terms of the underlying property use agreement with the property owner, but in no event shall the insurance be less than that required by the DBA Document;

Vending Area. DB Contractor shall provide access to general building vending area;

Utilities. Initial installation and monthly expense of all utilities paid by DB Contractor except long-distance telephone service;

Emergency Contacts. 24-hour emergency contact to DB Contractor; and

Furniture. DB Contractor-provided allowance of $15,000 in the Price for furniture, which shall be obtained by DB Contractor at the direction of TxDOT, and billed through DB Contractor. At the end of the Project, DB Contractor shall have ownership of the furniture and shall be entitled to the full salvage value of the furniture, with the right to retain or otherwise dispose of the furniture at its sole discretion, without any further accounting to TxDOT.

2 PROJECT MANAGEMENT

DB Contractor shall establish and maintain an organization that effectively manages all Elements of the work. This Project management effort shall be defined by and follow the Project Management Plan (PMP), which consists of project administration requirements and a collection of several management plan Elements (PMP Elements) describing discrete Elements of the work as described in Table 2-1 (Elements of the Project Management Plan) below, and is a living document for the duration of this contract. The PMP is an umbrella document that describes DB Contractor's managerial approach, strategy, and quality procedures to design and build the Project and achieve all requirements of the DBA Documents. Within the timelines for implementing each Element of the PMP, the plan shall include details of external auditing procedures.

Table 2-1: Elements of the Project Management Plan

Chapter Title	Section of Technical Provisions That Defines the Chapter Requirements
Administrative Requirements	Section 2
Quality Management Plan • **Design Quality Management** • **Construction Quality Management**	Sections 2 and 19
Safety and Health Plan	Section 2
Risk Management Plan	Section 2
Public Information and Communications Plan	Section 3
Comprehensive Environmental Protection Program	Section 4
Right Of Way Acquisition Plan	Section 7
Traffic Management Plan	Section 18
Maintenance Management Plan	Section 19

A listing of the documents to be included in the PMP is contained in Attachment 2-1 (Project Management Plan Contents), which also indicates when each document must be submitted to TxDOT.

TxDOT shall audit and monitor the activities described in the management plans to assess DB Contractor performance. All commitments and requirements contained in the PMP shall be verifiable.

2.1 Administrative Requirements

2.1.1 Project Schedule

2.1.1.1 General Requirements

The Project Schedule shall define the timeframe for completion of the Project and achievement of milestones, and be used to monitor progress and denote changes that occur during design and construction, as well as serve to determine the amount due DB Contractor for a progress payment, if applicable. Before the commencement of any Schedule Activity, DB Contractor shall submit a Project Baseline Schedule (PBS) in accordance with the Work Breakdown Structure (WBS).

2.1.1.2 Required Submittals

2.1.1.2.1 Project Baseline Schedule

DB Contractor shall use the Preliminary Project Baseline Schedule (PBS-1) submitted with the Proposal as a foundation to prepare a PBS and shall submit a draft of the PBS to TxDOT for review and approval. Approval of the PBS (PBS-2) shall be a condition of Notice to Proceed 2 (NTP2).

The PBS will be developed in stages beginning with the PBS-1. At each stage of PBS development, a new version will be created with more detail added. PBS-2 shall be progressed and updated monthly until PBS-3 is approved. The approved PBS-3 shall be progressed and updated monthly until a subsequent version (PBS-3+) is approved.

DB Contractor shall submit PBS-2 to TxDOT with a reasonable amount of time for TxDOT review prior to issuance of NTP2. TxDOT will review the PBS within fourteen (14) Days of submission. In the event that TxDOT does not accept the PBS, DB Contractor shall revise and resubmit it with changes clearly identified. TxDOT will review each resubmission of the PBS within ten (10) Days of resubmission. DB Contractor shall submit a single hardcopy of the PBS on full-size (11 inches x17 inches minimum, 24 inches x 36 inches maximum) color plot sheets, along with an electronic version of the schedule in its native format for each Submittal.

DB Contractor shall be responsible for updating scheduling software to maintain compatibility with current TxDOT-supported scheduling software. The scheduling software currently employed by TxDOT is Primavera v6. Compatible shall mean that DB Contractor-provided electronic file version of the PBS may be loaded or imported by TxDOT using TxDOT's scheduling software with no modifications, preparation, or adjustments. All scheduling software settings within the scheduling/leveling dialog box shall remain "default" unless otherwise approved by TxDOT.

PBS-3 and all subsequent schedule revisions (PBS-3+) shall be submitted sufficiently in advance to obtain approval prior to performance of any Utility Adjustment or Construction Work changed in the revised baseline schedule.

DB Contractor shall submit to TxDOT a revised PBS within fourteen (14) Days after each Change Order is executed. All approved Change Orders shall be incorporated into the originally planned execution of the Work. TxDOT shall confirm in writing the approval of each revised PBS. The approved PBS or current approved revised PBS shall remain in force until a subsequent revised PBS is approved by TxDOT.

The PBS shall include a separate narrative report which describes, in general fashion, DB Contractor's proposed methods of operation for designing and constructing the major portions of the Work required by the DBA Documents. The schedule narrative shall describe the general sequence of design and construction, the proposed Critical Path of the Project, and all milestone schedule deadlines.

The PBS shall include all major Work activities required under the DBA Documents, in sufficient detail to monitor and evaluate design and construction progress, from commencement of the Work to Final Acceptance of the Work. The PBS shall also include activities for ROW acquisition, Utility Adjustments, permit acquisitions, and interfaces with other projects, localities, municipalities and any Governmental Entity. For each major activity, DB Contractor shall indicate the duration (in Days) required to perform the activity, and the anticipated beginning and completion date of each activity. In addition, the PBS shall

indicate the sequence of performing each major activity and the logical dependencies and inter-relationships among the activities.

The PBS shall be organized consistent with the WBS, the minimum requirements which are included as Attachment 2-2 (Work Breakdown Structure Requirements), WBS requirements, and cost and resource loaded in accordance with Table 2-2 (Schedule Level of Detail Requirements). Each Schedule Activity shall be mapped to one and only one of the WBS Elements. DB Contractor shall further develop and detail the base WBS in accordance with its specific Schedule Activities while retaining the ability to summarize to at least the same level as shown in the base. DB Contractor may add additional activities to the levels presented in Attachment 2-2 (Work Breakdown Structure Requirements) with TxDOT's written approval.

Table 2-2: Schedule Level-of-Detail Requirements

Discipline	Detail	PBS-1	PBS-2	PBS-3+
Right of Way Acquisition	WBS Level	4	All levels	All levels
	Cost Loading	No	Yes	Yes
	Resource Loading	No	No	No
	Maximum duration of Schedule Activity	No maximum	20 Days[1]	20 Days[1]
Preconstruction Submittals & Permitting	WBS Level	4	All levels	All levels
	Cost Loading	No	No	No
	Resource Loading	No	No	No
	Maximum duration of Schedule Activity	No maximum	20 Days[1]	20 Days[1]
Utility Coordination	WBS Level	4	All levels	All levels
	Cost Loading	No	Yes	Yes
	Resource Loading	No	No	No
	Maximum duration of Schedule Activity	No maximum	20 Days[1]	20 Days[1]
Design	WBS Level	4	All levels	All levels
	Cost Loading	No	Yes	Yes
	Resource Loading	No	No	Yes
	Maximum duration of Schedule Activity	No maximum	20 Days[1]	20 Days[1]
Utility Relocation	WBS Level	5	5	All levels
	Cost Loading	Yes	Yes	Yes
	Resource Loading	No	No	Yes
	Maximum duration of Schedule Activity	No maximum	No maximum	20 Days[1]
Construction	WBS Level	4	4	All levels
	Cost Loading	No	Yes	Yes
	Resource Loading	No	No	Yes
	Maximum duration of Schedule Activity	No maximum	No maximum	20 Days[1]

[1]Or as otherwise approved by TxDOT.

At a minimum, all resource loading shall detail the number of crews and crew type. Prior to the inclusion of any crew in any PBS, DB Contractor shall provide TxDOT with a definition, the composition, and production rate for each crew type.

The PBS shall divide the Work into activities with appropriate logic ties to show DB Contractor's overall approach to the planning, scheduling, and execution of the Work. All Work shall be divided into reasonable sections, at a minimum by toll lanes, frontage roads and intersection work, and shall be represented by Schedule Activities. The duration and logical relationships of the Schedule Activities (or summaries at phase level) shall be based on the actual duration and relationships anticipated. DB Contractor shall not use calendar dates or constraints to logically begin or complete any Schedule Activity unless such calendar dates or constraints are shown in the Technical Provisions or other DBA Documents.

DB Contractor shall use standard and consistent Schedule Activity identification numbers, textual descriptions, and codes in all PBS Submittals, in a manner acceptable to TxDOT. Each PBS Submittal shall be clearly identified. Resubmissions of a PBS shall use the same revision number as the original submission, individually identified by a sequential appended letter (A, B, C, etc.), as an identification of a revised version.

DB Contractor shall allocate the total design-build contract Price throughout the Schedule Activities in the PBS. Such allocation shall accurately reflect DB Contractor's cost for each Schedule Activity and shall not artificially inflate, imbalance, or front-load line items. The price of each Schedule Activity shall be all-inclusive and shall include all direct and indirect costs, overhead, risks, and profit. Cost information shall be included with DB Contractor's first monthly Project Status Schedule Update.

Each milestone shall be separately identified, conform to the scheduling requirements set forth in the DBA Documents, and be assigned a "finish no later than" constraint date.

No unspecified milestones, constraints, Float suppression techniques, or use of Schedule Activity durations, logic ties, and/or sequences deemed unreasonable by TxDOT, shall be used in the PBS. Each PBS Submittal shall clearly and individually define the progression of the Work within the applicable time frame by using separate Schedule Activities. The Critical Path shall be highlighted in red on all schedules to distinguish critical Schedule Activities from other Schedule Activities and Float shown for all Schedule Activities.

Float shall not be considered as time for the exclusive use of, or benefit of, either TxDOT or DB Contractor, but shall be considered as a jointly owned, expiring resource available to the Project and shall not be used to the financial detriment of either party. Any method utilized to sequester Float calculations will be prohibited without prior approval of TxDOT. Any schedule, including the PBS and all updates thereto, showing an early completion date shall show the time between the scheduled completion date and the applicable milestone schedule deadline as "project float."

The PBS shall be used by the Parties for planning and monitoring the progress of the Work, as well as serving as the basis for determining the Draw Request amount that may be compensable to DB Contractor. The updated PBS shall show actual progress and not calculated progress. Approved logic changes and approved changes to the DBA Documents shall be incorporated into the PBS.

The materials, labor, or equipment quantity that the Schedule Activity value will be based on shall be indicated as a resource, and only those resources actually available to DB Contractor shall be included. Labor-loading of activities may be based upon total number of workers, but, at a minimum total number of crews. Major construction equipment to be used by DB Contractor and Subcontractors at all tiers in prosecuting Work shall be assigned to applicable activities. The quantity shall represent the estimated effort in-place for the Schedule Activity value.

DB Contractor shall develop the WBS with clearly identifiable linkage to the Schedule of Values and DB Contractor-designed Schedule Activities and phases represented in the PBS. The Schedule Activity for each Work Element shall indicate the duration, timing, and logical relationship to other Work Elements, including to Schedule Activities other than the parent Schedule Activity of the particular Work Element. Schedule Activities shall be broken down minimally to Work Elements (for example, bridges shall be broken down into foundations, substructure, superstructure, and decks). All Work shall be broken down to similar manageable Work Elements. For mobilization Schedule Activities or Work Elements, DB Contractor shall provide a list of Work items that are included in each Schedule Activity or Work Element.

The PBS shall include a listing of all Submittals as called out in the DBA Documents. Submittal activity durations shall include specific durations for TxDOT review and/or approval of DB Contractor's Submittals as called out elsewhere in the DBA Documents and the Technical Provisions.

With the exception of activities relating to Environmental Approvals by any jurisdictional Governmental Entity, each activity depicting DB Contractor's operations shall have a duration of not more than twenty (20) Days, and not less than one (1) Day, except as otherwise approved by TxDOT. All activities shown in the schedule, with the exception of the first and last activities, shall have a minimum of one predecessor and a minimum of one successor activity.

The Project title and data date shall be displayed on all schedules, charts, and diagrams. A legend shall be provided on all schedules, charts, and diagrams which indicate the various symbols used and their meanings.

2.1.1.2.2 Project Status Schedule Updates

Beginning with the first full month after NTP2, DB Contractor shall submit to TxDOT the Project Status Schedule Updates. The Project Status Schedule Updates shall be submitted monthly, as part of the monthly Progress Report and Draw Request, if applicable, until Final Acceptance of the Work.

The Project Status Schedule Updates shall accurately reflect the current status of the Project, including all activities completed as of the effective date of the current PBS, Recovery Schedules, schedule revisions due to approved Change Orders, DB Contractor's detailed schedule for completing the Work, and all information and reporting required for the Project Schedule. At a minimum, the monthly Project Status Schedule Update(s) shall include the following current Work data:

- Detailed resource-loaded schedule of activities that clearly identify the Critical Path.
- If applicable, progress for the current Draw Request period for all Project activities.
- Actual start and finish dates of Work, physical percent complete, and Days remaining for Work in progress.

The data date for use in calculating the Project Status Schedule Update shall be the first Day of the following month. The Project Status Schedule Update shall accurately reflect the updated progress as of the effective date of the updated PBS, forecast the finish for in-progress Schedule Activities, re-forecast early dates and late dates for the remaining Schedule Activities, and shall indicate the overall physically complete percent of the Project. If any actual dates are changed or corrected in any following month, a narrative must be included providing explanation of the change.

Time-scaled network diagrams shall be submitted, on at least a monthly basis, on sheets no larger than 22 inches x 34 inches, using a scale that yields readable plots. The network diagrams shall be organized consistent with the Project WBS. Project activities shall be linked by logic ties and shown on their early dates. The Critical Path shall be highlighted and Float, where applicable, shall be shown for all Project activities.

The monthly Project Status Schedule Update(s) shall include additional, separate, filtered lists of Project activities and work Elements included in the Project Schedule to create the following reports:

a. Coordinating with and accomplishing Work associated with any Utility;

b. Bar chart schedule sorted by segment or section indicating the physical status of all activities as of date of the update;

c. Graphical report, which compares DB Contractor's progress to planned progress by segment or section, and major payment item/WBS;

d. Design document Submittals for the forthcoming period;

e. Tabular report listing all activities with ten (10) Days or less of Float;

f. Sixty-day (60) look ahead report on all required TxDOT and Governmental Approvals;

g. Ninety-day (90) look ahead bar chart schedule sorted by WBS and activity early start dates;

h. Monthly expenditure projections and cash expenditure curves by WBS;

i. Critical Path items graphical report for each Critical Path sorted by activity early start date; and

j. Time-scaled Critical Path network plot indicating the status of all activities as of the date of the update.

The reports shall be accompanied by a narrative Progress Report describing the status of the Project in detail, including progress made that period; plans for the forthcoming period; all potential delays and problems; their estimated effect on the Project Schedule and overall completion, and whether the Project is on, ahead of or behind schedule.

TxDOT will review the monthly Project Status Schedule Update(s) for consistency with DB Contractor's WBS and the current approved Project Schedule and for conformance with the DBA Documents. DB Contractor shall correct any deficiencies and resubmit its monthly Project Status Schedule Update(s) with the Draw Request. TxDOT will notify DB Contractor of corrections required within ten (10) Business Days of receipt of the Project Status Schedule Update(s).

TxDOT will use these updates to manage its activities to be responsive to DB Contractor's Project Schedule, to analyze monthly progress payments to DB Contractor, and to measure DB Contractor's performance with respect to its plan for accomplishing the Work.

DB Contractor shall submit a single hard copy of the Project Status Schedule Update in full-size ((11 inches x17 inches minimum, 24 inches x 36 inches maximum)) color plot sheets, along with an electronic version of the schedule in its native format. Software settings shall not be changed or modified, for any schedule submissions, without prior TxDOT approval. No changes in activity durations, calendar assignments, logic ties, or constraints will be allowed in the Project Status Schedule Update without the prior written approval of TxDOT.

2.1.1.2.3 Schedule of Values

Concurrent with the PBS, DB Contractor shall submit to TxDOT a complete Schedule of Values for all Payment Activities as described below for TxDOT's approval. TxDOT approval of the Schedule of Values shall be a condition of NTP2. In addition, no payment by TxDOT will be made until the Schedule of Values is approved by TxDOT.

The following pertains to presentation of the Schedule of Values:

a. The Payment Activities shall be organized and grouped according to the approved WBS, with subtotals for each WBS item at each WBS level. There can be one or more Payment Activities

for each of the lowest (terminal) WBS Elements in the WBS. For example, earthwork (WBS level VI) could have one Payment Activity or multiple Payment Activities that roll up costs to the WBS level VI Element;

b. The Schedule of Values shall contain for each Payment Activity from the PBS, the activity unique identification number, the activity description, the quantity, the applicable unit, unit price, and scheduled value; and

c. DB Contractor's project management, administration, design, contingencies and any allowance for inflation, profit and financing, as well as indirect site costs such as site cleanup and maintenance; temporary roads and access; off-site access roads; and security shall be prorated through all Payment Activities so that the sum of all the Schedule of Values line items equals the total project construction cost.

If it becomes necessary to add, combine, eliminate, or modify any Payment Activities due to changes in the Work, a revised Schedule of Values as derived from a revised PBS, shall be submitted fourteen (14) Days after the Change Order is executed for acceptance by TxDOT.

2.1.1.2.4 Progress Report

Each month, beginning with the first full month after NTP2, DB Contractor shall submit to TxDOT the Progress Report. DB Contractor shall submit the Progress Report by close of business within seven (7) Days following prior month's end. An electronic and printed copy of the entire Progress Report shall be submitted to TxDOT.

The Progress Report shall contain a narrative which shall include the following items:

a. Describe the progress for each section and the Project as a whole, including all phases of Work. Identify the start date and the completion dates on major areas of Work. Group the information based on the WBS;

b. Summarize the quality assurance (QA)/quality control (QC) findings;

c. List any Change Orders that were identified or executed during the period from the submission of the previous month's Progress Report to the submission of the current Progress Report, including their status;

d. Identify Schedule Activities planned for the upcoming period;

e. Identify problems and issues that arose during the period from the submission of the previous month's Progress Report to the submission of the current Progress Report, and issues that remain to be resolved;

f. Summarize the resolution of the problems and issues raised in the previous Progress Reports or resolved during the period from the submission of the previous month's Progress Report to the submission of the current Progress Report;

g. Identify Critical Path issues and proposed resolution;

h. Provide a report on the milestone schedule deadlines showing the schedule dates for the immediate prior month and current month. A narrative is required to explain why the dates have changed for variances greater than thirty (30) Days;

i. Provide monthly expenditure projection curves for the total Project;

j. Identify requested and/or required TxDOT actions for the next month; and

k. Provide digital progress photographs that accurately depict Project progress as outlined in the Progress Report narrative.

The Project Status Schedule Update shall be provided as part of the Progress Report using the following print outs:

a. Gantt chart sorted by Work areas indicating the physical status of all Schedule Activities as of the date of the update and comparing DB Contractor's progress to planned progress;

b. Gantt chart showing all critical Schedule Activities, sorted by early start dates;

c. Ninety-day (90) look ahead Gantt chart showing all upcoming Submittals from DB Contractor and approvals required by TxDOT or any jurisdictional Governmental Entity;

d. Ninety-day (90) look ahead Gantt chart grouped by WBS and sorted by early start dates; and

e. Gantt chart that clearly identifies the longest path sorted by early start dates.

If any progress payment is to be submitted, it shall accompany the monthly Progress Report.

If requested by TxDOT, DB Contractor shall make all corrections to the monthly Progress Report and resubmit. If DB Contractor does not agree with TxDOT's comments, DB Contractor shall provide written notice of disagreement within seven (7) Days from the receipt of the comments.

2.1.1.2.5 As-Built Schedule

Upon completion of the Punch List, DB Contractor will submit the Project Status Schedule Update identified as the "as-built schedule". The "as-built schedule" shall reflect the exact manner in which the Work up to each Final Acceptance, and described by the DBA Documents, was actually performed (including start and completion dates, Schedule Activities, actual durations, sequences, and logic). The "as-built schedule" shall be signed and certified by DB Contractor's Project Manager and DB Contractor's scheduler as being a true record of when the Work was actually performed. The "as-built schedule" that TxDOT determines is both correct and complete is a requirement for Final Acceptance.

2.1.1.2.6 Revisions

If it becomes necessary to add, combine, eliminate, or modify Payment Activities or Schedule Activities to reflect modifications to the Work, such changes shall be made through a Change Order that has been provided by TxDOT, and therefore reflected in the Project Schedule. Revisions to the Project Schedule and consequent realignment of funds between Payment Activities may be requested by DB Contractor through a Request for Change Order.

2.1.1.3 Time Impact Analysis

For every notice seeking time relief, DB Contractor shall submit a written time impact analysis illustrating the influence of each delay event. Each time impact analysis shall include a fragmentary network demonstrating how DB Contractor proposes to incorporate the change, delay, or DB Contractor request into the current Project Status Schedule Update.

The time impact analysis shall demonstrate the time impact to each and every affected Schedule Activity in the current Project Status Schedule Update utilizing the most recent schedule update as the basis for the analysis. The date of the most recent schedule update shall be a date prior to the date the change is given to DB Contractor, the date the delay occurred, or the date DB Contractor submits a Request for Change Order. The event times used in the time impact analysis shall include the most recent Project Status Schedule Update, or as adjusted by mutual agreement.

The time impact analysis Submittal shall include the details of the change, including added, changed or deleted data for Schedule Activities and logic. If the current Project Status Schedule Update is revised subsequent to submittal of a time impact analysis but prior to its acceptance, DB Contractor shall promptly indicate in writing to TxDOT the need for any modification to its time impact analysis.

Delays shall not automatically mean that an extension of any milestone is warranted or due to DB Contractor. TxDOT will accept time extensions associated with Change Orders only to the extent that time adjustments to the Schedule Activity or Activities affected by the change or delay exceeds to total (positive or zero) Float of a critical Schedule Activity (or path) and extends the affected milestone schedule deadline(s). In the case of multiple lines of negative Float, the change or delay must cause the affected path to exceed all others before a time extension will be granted.

DB Contractor shall submit one printed Gantt chart, including all Schedule Activities affected by the time impact analysis, grouped and sorted by WBS and compared to the current Project Schedule Baseline. In addition, DB Contractor shall provide one electronic backup of the Project Schedule with the time impact analysis and a comprehensive narrative for each relief request or compensation event Notice.

DB Contractor shall incorporate the results of any Change Orders into the Project Status Schedule Update for the next Progress Report.

2.1.1.4 Recovery Schedule

If the Work is delayed on any Critical Path item for a period which exceeds the greater of either thirty (30) Days in the aggregate, or that number of Days in the aggregate equal to five (5) percent of the Days remaining until Final Acceptance for the last Project segment, the next Project Status Schedule Update shall include a Recovery Schedule demonstrating the proposed plan to regain lost Project Schedule progress and to achieve Final Acceptance by the specified date.

If the Recovery Schedule is required hereunder, DB Contractor shall have no right to receive settlement of a Draw Request until such time as DB Contractor has prepared and TxDOT has accepted such Recovery Schedule.

2.1.2 Document Management

All electronic information submitted to TxDOT shall be searchable and legible.

2.1.2.1 Document Storage and Retrieval Requirements

DB Contractor shall establish and maintain an Electronic Document Management System (EDMS) to store, catalog, and retrieve all DBA documents using the applicable control section job (CSJ) numbers. EDMS shall be established and operational either within thirty (30) days after Notice to Proceed 1(NTP1), or prior to receiving first Submittals from DB Contractor, whichever comes first. Unless otherwise directed by TxDOT, record retention shall comply with the requirements of the *Texas State Records Retention Schedule*, and shall be provided to TxDOT at the time of the expiration of the Term or earlier termination of the DBA Documents.

Maintenance records shall utilize the same format as TxDOT utilizes for its statewide asset inventory and condition assessments and shall be capable of being integrated into TxDOT's maintenance management systems.

Construction quality acceptance test results shall be automatically transmitted to TxDOT's I2MS system using TxDOT's extensible markup language (XML) web service. A sample is shown in Attachment 2-3 (I2MS Test Form Fields). DB Contractor shall coordinate with TxDOT to obtain the most current version prior to commencing construction quality acceptance testing. The responsible technician and his/her supervisor shall sign the daily test reports and the results of the daily tests shall be provided to TxDOT within 48-hours after test completion.

In the provision of a document management system, DB Contractor shall:

a. Use data systems, standards, and procedures compatible with those employed by TxDOT and implement any new operating practices required as a result of TxDOT's amendments to any such systems, standards, and procedures;

b. Provide a secure location for any interface as may be provided by TxDOT, such that only authorized users have access and that it is protected from loss, theft, damage, unauthorized, or malicious use;

c. Employ appropriate standards and procedures, and train DB Contractor personnel to operate any TxDOT data management system that TxDOT may require in connection with the Project; and

d. Provide a mechanism for the electronic transfer of metadata along with the associated portable document format (PDF) images for uploading into an EDMS employed by TxDOT.

To allow for disaster recovery, DB Contractor shall back-up all Project-related documents on a nightly basis and store all Project-related documents in a secure off-site area on a weekly basis.

DB Contractor shall provide TxDOT at DB Contractor's expense, sufficient access to DB Contractor's document control database as deemed necessary by TxDOT.

2.2 Quality Management Plan

DB Contractor shall submit a comprehensive Quality Management Plan to TxDOT for approval, in accordance with Attachment 2-1 (Project Management Plan Contents) and the requirements set forth below, that is consistent with and expands upon the preliminary Quality Management Plan submitted with the Proposal.

The Quality Management Plan shall comply with ISO 9001:2008 for quality systems, quality plans and quality audits, or most current version, as updated by the International Standards Organization. DB Contractor may elect to obtain formal ISO 9001 certification, but will not be required to do so. DB Contractor's Quality Management Plan shall comply with the requirements of current *TxDOT Design-Build Quality Assurance Program Implementation Guide*.

2.2.1 General Requirements

DB Contractor shall develop, implement, and maintain the Quality Management Plan for the Term. The Quality Management Plan shall describe the system, policies, and procedures that ensure the Work meets the requirements of the DBA Documents and provides documented evidence of same.

The complete Quality Management Plan shall incorporate the following features:

a. DB Contractor shall make all quality records immediately available to TxDOT for review. DB Contractor shall provide TxDOT with a copy of any and/or all quality records when requested;

b. The Quality Management Plan shall encompass all Work performed by DB Contractor and DB Contractors of all tiers;

c. DB Contractor shall submit to TxDOT the results of all Project quality audits within seven (7) Days of their completion; and

d. DB Contractor shall promptly submit to TxDOT non-conformance reports both upon issuance and resolution.

The Quality Management Plan shall contain detailed procedures for DB Contractor's quality control and quality assurance activities. DB Contractor's quality process shall incorporate planned and systematic verifications and audits undertaken by an independent party. DB Contractor shall conduct all quality control, quality assurance, performance verification, and design overlay and coordination among design disciplines, all in accordance with the Quality Management Plan and the requirements of the DBA Documents.

Inspections, reviews, and testing shall only be performed by personnel with appropriate training and qualifications, for each appropriate item of Work (items produced on and off the Project site) using appropriate equipment that is accurately calibrated and maintained in good operating condition at an

AASHTO (AASHTO R18-10, *Establishing and Implementing a Quality System for Construction Materials Testing Laboratories*) accredited facility, or at a facility with comparable accreditation (e.g., ISO 17025, *General Requirements for the Competence of Testing and Calibration Laboratories*).

2.2.2 Quality Terminology

Quality terminology, unless defined or modified elsewhere in the DBA Documents, shall have the meaning defined in ISO 9001. Terms used in ISO 9001 shall have the meanings defined below:

a. Organization: DB Contractor's organization, including any Affiliates and DB Contractor-Related Entities.
b. Customers: the Users of the roadways, TxDOT, Customer Groups, and key stakeholders that have an adjacent property interest or connecting roadway.
c. Product: the Work.

2.2.3 Quality Management Organization

DB Contractor shall regularly maintain the Quality Management Plan to contain current versions of the following information:

a. The organizational chart that identifies all quality management personnel, their roles, authorities, and line reporting relationships;
b. Description of the roles and responsibilities of all quality management personnel and those who have the authority to stop Work;
c. Identification of testing agencies, including information on each agency's capability to provide the specific services required for the Work, certifications held, equipment, and location of laboratories for products produced both on and off the Project site; and
d. Resumes for all quality management personnel.

2.2.4 Quality Policy

The Quality Management Plan shall contain a complete description of the quality policies and objectives that DB Contractor will implement throughout its organization. The policy shall demonstrate DB Contractor senior management's commitment to implement and continually improve the quality management system for the Work.

2.2.5 Design Quality Management Plan

DB Contractor shall prepare and submit to TxDOT for review and approval a Design Quality Management Plan (DQMP) that describes its policies, procedures, and staffing to manage design quality in accordance with the requirements of this Section 2.2.5 and Attachment 2-1 (Project Management Plan Contents) of the Technical Provisions.

2.2.5.1 DQMP General Requirements

The DQMP shall describe and include the following general requirements:

a. The quality control and quality review procedures for Professional Services products shall be organized by discipline (such as structural, civil, utilities). These procedures shall specify measures to ensure that appropriate quality requirements are specified and included in the Professional Services product and to control deviations from such requirements;

b. Specific quality control and quality review procedures, including all required forms and checklists, shall be specified for preparing, verifying, and checking all Professional Services products to ensure that they are independently checked and back-checked in accordance with generally accepted engineering practices in the State of Texas and the requirements of the DBA

Documents. The checking of structural design shall include a set of independent calculations, performed by DB Contractor's design firm for all structural Elements;

c. The designer and checker shall be clearly identified on the face of all Final Design Documents. The DQMP shall also include specific procedures for verifying the Professional Services product, along with any computer programs being used for such purposes. Design Documents shall be stamped, signed, and dated by the Engineer in Responsible Charge for that item, Element, or phase of the Work;

d. Procedures shall be described for coordinating Professional Services performed by different individuals or firms working in the same area, in adjacent areas, or on related tasks to ensure that conflicts, omissions, or misalignments do not occur between drawings or between the drawings and the specifications. This shall also include the coordination of the review, approval, release, distribution, and revision of documents involving such parties;

e. Procedures shall: (1) ensure that DB Contractor personnel are familiar with all the provisions of the DBA Documents concerning their respective responsibilities; (2) provide for the education, training and certification, as appropriate, of personnel performing activities affecting or assessing the quality of the Work to assure that such personnel achieve and maintain reasonable proficiency; and (3) ensure that the Work is performed according to the DQMP, generally accepted engineering practices in the State of Texas, and the DBA Documents;

f. Procedures shall be established for meeting documentation requirements; the filing of design criteria, reports and notes, calculations, plans, specifications, Base Scope Schematic and supporting materials needed during the Final Design, and the specific responsibilities of personnel to satisfy these requirements. All Design Documents shall be maintained, organized and indexed by DB Contractor and copies made available to TxDOT upon request; and

g. Procedures and schedules for the Professional Services Quality Control Manager (PSQM) to perform audits of the design firm's quality control procedures under the DQMP.

2.2.5.2 Personnel and Staffing

2.2.5.2.1 Professional Services Quality Control Manager

DB Contractor shall assign a Professional Services Quality Control Manager (PSQCM) who shall be responsible for management of quality control program including both quality control and quality assurance activities for the design, environmental, ROW, Utilities, and survey. The PSQCM shall not be involved with direct scheduling or production activities and shall report directly to DB Contractor's Lead Quality Manager. The PSQCM shall see that the methods and procedures contained in the approved DQMP are implemented and followed by DB Contractor's design staff in the performance of the Work. The PSQCM shall be a Registered Professional Engineer.

2.2.5.2.2 Personnel in Responsible Charge

DB Contractor shall designate (by name) the personnel in responsible charge for each item, Element, or phase of the Work. The personnel in responsible charge shall possess the necessary registrations in the State of Texas and shall be personally responsible for directly supervising the Work and who will stamp, sign, and date the Professional Services product for a given item, Element, or phase of the Work as applicable.

2.2.5.2.3 Reviewing Professional Services

DB Contractor personnel performing the quality control check of the Professional Services shall not be directly involved with the original development of the item, Element, or phase being checked.

2.2.5.2.4 Design Quality Assurance Staff

A quality assurance staff shall be provided under the direction of the PSQCM to perform oversight and review of all design, environmental, Utilities, and survey performed by any member of DB Contractor's group.

The quality assurance staff shall be experienced in the various aspects of roadway design undertaken by DB Contractor. The training and experience of the quality assurance staff shall be commensurate with the scope, complexity, and nature of the design work to be reviewed. Qualifications shall include appropriate experience, certifications, training, and licensure. Design quality assurance staff shall report to the PSQCM.

2.2.5.2.5 Design Quality Assurance Staff Levels

The size of the quality assurance staff shall reflect the volume of quality assurance activities necessary for the Work in progress and shall be maintained in accordance with the approved DQMP. The quality assurance staff shall perform quality assurance oversight and review typically performed by TxDOT on traditional projects.

The design quality assurance staffing requirements shall be updated as necessary throughout the Term of Work to reflect changes in the actual design schedule. DB Contractor shall ensure that adequate design quality assurance staff is available and that DQMP activities are undertaken in a manner consistent with the Project Schedule and in a manner that will enable DB Contractor to achieve the Substantial Completion Deadline and Final Acceptance Deadline.

Should TxDOT determine that DB Contractor is not complying with the DQMP because of lack of staff or ethical standards, TxDOT shall have the right, without penalty or cost, including time extensions or delay damages, to restrict Work efforts until appropriate levels of staffing consistent with the DQMP and satisfactory to TxDOT are obtained, or TxDOT may contract with a separate firm to perform these services and withhold payment to DB Contractor for such services.

2.2.5.3 Professional Services Submittal Review Process

DB Contractor shall conduct a series of working meetings with its Professional Services staff, the internal quality control of DB Contractor staff, the PSQCM, and TxDOT to establish workflow processes and procedures to be utilized during the design review process that are consistent with the DBA Documents. The working meetings are also to develop an understanding on general design concepts such as geometrics, aesthetics, drainage, traffic control, and structures.

DB Contractor and TxDOT shall collaborate and mutually agree upon (1) a list of proposed sections (i.e., Station x+xx to Station y+yy) for the Work; (2) Professional Services packaging and content (such as drainage, individual structures, roadway, traffic sequencing, and others); (3) a list of mandatory Submittals; and (4) a proposed Submittal schedule. The Professional Services reviews shall be evenly scheduled over the duration of the Professional Services phase of the Work. Sections and packages shall be logically organized into manageable pieces and shall contain sufficient information and details to confirm DB Contractor intent and to validate conditions. DB Contractor shall obtain TxDOT's written approval of the sections, packages and contents, the schedule, and the methodology prior to making the first Submittal.

The PSQCM shall chair the Submittal reviews with TxDOT, and DB Contractor shall maintain formal documentation of these meetings for TxDOT's audit.

The purpose of the Submittal reviews is for TxDOT to review Professional Services products for general compliance with Project requirements, sound engineering practice, applicable Law, the Governmental Approvals, and the DBA Documents. All Submittals are subject to review and comment by persons designated in the Technical Provisions.

If DB Contractor and TxDOT cannot come to an agreement on the list of mandatory Submittals, the following list and compliance with 43 Tex. Admin. Code § 27.56 shall be provided at minimum:

- Corridor Structure Type Study and Report Submittals;
- Preliminary Pavement Design Report;
- Preliminary Drainage Design Report;
- Preliminary Geotechnical Report;
- Preliminary Retaining Wall Layouts;
- Preliminary Bridge Layout Submittals;
- Preliminary Design Submittal;
- Final Design Submittal;
- Any deliverables described in the Technical Provisions;
- Exhibits supporting railroad agreements; and
- Design Exceptions and Design Waiver Requests.

2.2.5.3.1 Submittal Requirements

DB Contractor shall prepare and provide all Project related Submittals and documents using English units of measure.

DB Contractor shall furnish all Submittals by electronic copy in accordance with Section 2.1.2 (Document Management). Unless otherwise stated in the DBA Documents, DB Contractor shall provide to TxDOT four (4) paper copies and a single electronic copy of each Submittal. Each Submittal shall have the signature of an Authorized Representative of DB Contractor, unless otherwise expressly stated for a particular Submittal. The electronic copy shall be in a suitable format (e.g. PDF) or in the format in which the Work was originally created unless stated otherwise in the DBA Documents

DB Contractor shall include with each Submittal a transmittal cover sheet in a form acceptable to TxDOT.

The minimum sheet size for the Submittals shall be 8.5 inches by 11 inches. The maximum sheet size shall be 36 inches by 120 inches. Every page in a Submittal shall be numbered in sequence.

Each Submittal shall be full and complete and shall be assigned a unique, sequential number, clearly noted on the transmittal cover sheet. The original Submittal shall be assigned a unique numeric Submittal number. Revised Submittals shall bear an alphanumeric designation which consists of the unique Submittal number assigned to the original Submittal followed by a letter of the alphabet to represent that it is a subsequent Submittal of the original.

Any changes made on a revised Submittal, other than those made or requested by TxDOT, shall be identified and noted on the revised Submittal.

Design Submittals shall include a title block, consistent with the standard Project drawing format established as part of the Quality Management Plan, with the following information:

a. Date of issuance, including all prior revision dates;
b. Contract title and number;
c. The names of DB Contractor and applicable Affiliates and DB Contractor-Related Entities;

d. Stage of development;

e. Reference to applicable technical documents and amendments;

f. If required, review and acceptance or approval from a Governmental Entity, prior to submission to TxDOT;

g. Review stamp;

h. Action block space – All deliverables shall include a sufficient blank space in which DB Contractor may list required actions to be taken;

i. When calculations accompany drawings in a Submittal, cross-references from the body of the calculations to the individual drawing to which the pages of the calculations pertain; and

j. Organization of the CADD drawings and associated documents in a logical manner, having a uniform and consistent appearance, and clearly depicting the intention of the design.

2.2.5.3.2 Final Design Submittal

The Final Design Submittal shall be certified by the PSQCM and submitted to TxDOT and the Authority for general review. Construction packages for individual Work items, Elements, or phases shall be organized such that the final document package can be assembled in a manner similar to the standard construction documentation typically provided to TxDOT for conventional project letting, as mutually agreed upon by DB Contractor and TxDOT.

When DB Contractor has completed the Final Design Submittal for an item, Element, or phase and wishes to obtain TxDOT concurrence of such a design, the PSQCM shall certify that:

a. The design meets all applicable requirements of the DBA Documents, applicable Law and the Governmental Approvals;

b. The design has been checked in accordance with DB Contractor's approved DQMP;

c. The item or Element is ready for construction; and

d. DB Contractor has obtained all required Governmental Approvals and Utility Owner approvals.

e. The Final Design Submittal shall be complete Design Documents incorporating all of the design Submittal review comments. All documentation, including copies of TxDOT's approval of deviations for design standards and/or Design Exceptions, shall be provided with the Final Design Submittal.

2.2.5.3.3 Formal Review

The PSQCM shall conduct a formal review presentation of the Final Design Submittal with TxDOT at a location acceptable to TxDOT prior to certification.

At least five (5) Business Days prior to the applicable formal review presentation dates of the Final Design Submittals, DB Contractor will assemble and submit drawings or other documents to TxDOT for information and review.

Draft minutes of formal review presentations shall be submitted to TxDOT by the PSQCM within five (5) Business Days after completion of each review.

2.2.5.4 Resubmittal Process

Resubmittals of any design Submittal may be required if deemed necessary by TxDOT or any Governmental Entities with jurisdiction over the Project. Each resubmittal must address all comments received from a prior Submittal in a manner satisfactory to the commenting party. Submittals shall be

resubmitted as many times as necessary to address comments from TxDOT or any Governmental Entity with jurisdiction over the Project.

If TxDOT had requested additional information during the final formal review, the PSQCM will conduct an additional formal review of the resubmitted items, Elements, or phases. A copy of all correspondence relating to each Submittal made to any Governmental Entity with jurisdiction over the Project shall be concurrently provided to TxDOT.

2.2.5.5 Certification of Compliance

The PSQCM shall verify that DB Contractor obtained approval from applicable Governmental Entities and Utility Owners prior to the issuance of a "Certification of Compliance" designation of the Design Documents by the PSQCM. Following issuance of a "Certification of Compliance" by the PSQCM, TxDOT shall review and provide written concurrence and DB Contractor shall proceed with issuing the Released for Construction Documents.

After DB Contractor has incorporated the Final Design Submittal and/or the resubmittal of formal review comments into its design and all concerns and questions have been resolved to the satisfaction of TxDOT, DB Contractor shall provide Final Design package to TxDOT. DB Contractor, as part of its Final Design package, shall include all:

a. Design drawings;

b. Design calculations;

c. Design reports;

d. Specifications;

e. Electronic files;

f. Governmental Approvals; and

g. Utility Owner approvals.

TxDOT's concurrence with the PSQCM's certification of compliance will not constitute approval of the design or subsequent construction, nor will it relieve DB Contractor of its responsibility to meet the requirements hereof. Irrespective of whether TxDOT provides DB Contractor with the authority to begin construction on items, Elements, or phases of the Work prior to completion of the design for the entire Project, DB Contractor shall bear the responsibility to assure that construction meets the requirements of the DBA Documents, applicable Law, and Governmental Approvals.

Construction on any item, Element or phase covered by the PSQCM's certification of compliance of said item, Element, or phase shall only progress to the extent covered by the Design Documents included in that statement except for the Work performed in accordance with Section 2.2.5.8 (Early Start of Construction). Prior to issuing a Released for Construction Document and progressing further with construction of a certified package, DB Contractor shall complete the next item, Element, or phase of design, or complete the Final Design and obtain TxDOT's concurrence, except for the Work performed in accordance with Section 2.2.5.8. Any items, Elements, or phases of design, subsequent to the certification of compliance from the PSQCM, shall be checked and certified by the PSQCM in the same manner indicated above.

If TxDOT or the PSQCM determines that the Final Design Documents do not meet the requirements of the DBA Documents, applicable Law, and/or the Governmental Approvals, TxDOT or the PSQCM will notify DB Contractor in writing of any specific deficiencies in the Final Design Documents. DB Contractor shall correct such deficiencies; modify the Final Design Documents; and, if necessary, modify construction upon receipt of TxDOT's comments.

If there is evidence that the DQMP procedures are not adequate, as evidenced by TxDOT or the PSQCM's oversight and audit reviews, respectively, or problems that may arise during construction, TxDOT may, at its sole discretion, withhold payment for design and construction until sufficient DQPM procedures are in place. If construction is in progress, TxDOT may suspend ongoing Work represented by the deficient design and require correction of design and/or construction defects.

DB Contractor shall provide quantity estimates for Work covered by Final Design Documents. The quantity estimates shall be in units consistent with the quality acceptance and quality review sampling and testing requirements in the DQMP.

2.2.5.6 Released for Construction Documents

DB Contractor shall submit to TxDOT all Released for Construction Documents in accordance with the Submittal requirements of the Design Quality Management Plan. DB Contractor's Released for Construction Documents shall comply with the requirements of the DBA Documents, and shall be detailed, complete, constructible, and shall allow verification of the design criteria and compliance with DBA Documents.

Not later than two (2) Business Days after DB Contractor has completed design of any particular Released for Construction Document, DB Contractor shall submit the signed and sealed document to TxDOT.

2.2.5.7 Design Changes

DB Contractor or TxDOT may initiate design changes. Design changes may occur either on items, Elements, or phases undergoing construction or after Final Design. In order to process these types of changes, DB Contractor shall submit, when the problem or change occurs, a Request for Information (RFI) for TxDOT's approval.

All design changes submitted under the RFI procedure shall undergo the same DQMP checks as the original design.

The designer responsible for the original design shall approve design changes during construction, or design changes to Final Design Documents in writing. If the original designer is no longer available, then after notification to the original designer, a Registered Professional Engineer shall provide documentation of design changes. All plans, final Submittals, specifications, calculations, and reports for design changes shall be stamped, signed, and dated by a Registered Professional Engineer. In all cases, the PSQCM shall certify in writing that the design change has been:

a. Designed in accordance with the requirements of the DBA Documents, applicable Law, and the Governmental Approvals;

b. Checked in accordance with DB Contractor's approved DQMP; and

c. Prepared consistently with other Elements of the original design.

DB Contractor shall request and schedule interim and final RFI formal design review(s) by TxDOT and the PSQCM for all design changes made during construction or to the Final Design Plans. Design changes submitted under an RFI that are minor may not warrant interim review in addition to final formal design review(s) by TxDOT. Design changes eligible for a single review shall be defined in the DQMP and approved by TxDOT. All changes made through the RFI process shall be documented in the as-built drawings.

2.2.5.8 Early Start of Construction

a. The following will set forth the circumstances under which certain items, Elements, or phases of the Work may be packaged by DB Contractor to initiate an Early Start of Construction prior to

obtaining TxDOT's concurrence of the Final Design for the item, Element, or phase. The "Early Start of Construction" requirements shall apply to any Work that is performed by DB Contractor prior to receiving TxDOT's written concurrence with the PSQCM's certification of compliance of the Final Design Submittal for the Work. All such Work is performed at the sole risk of DB Contractor. TxDOT does not consider any items as satisfying the DQMP requirements until the PSQCM has issued a certification of compliance and TxDOT has issued a written concurrence therewith.

b. TxDOT, at its sole discretion, may defer Early Start of Construction for any portions of the Work as requested by DB Contractor.

c. Any Work constructed by DB Contractor prior to receiving TxDOT's concurrence of the Final Design Submittal for the Work, and later determined to be unacceptable by TxDOT, in its sole discretion, shall be revised, removed, or otherwise reconfigured to the satisfaction of TxDOT at DB Contractor's sole cost and expense and without any consideration given to an extension of the Completion Deadline.

d. TxDOT and DB Contractor shall agree on procedures for Early Start of Construction, which procedures shall among other things, include a process for distributing construction documents signed and sealed by a Registered Professional Engineer to TxDOT and DB Contractor's field staff. The PSQCM shall also conduct a formal review presentation of the Early Start of Construction design Submittal with TxDOT and provide TxDOT with the Submittal drawings or other documents for information and review at least five (5) Business Days prior to the presentation date. In order for DB Contractor to proceed with early phases of construction of a portion of the Work, specific pertinent items of the design shall have been previously reviewed by TxDOT and comments from TxDOT shall have been transmitted to DB Contractor prior to the formal review presentation. For example, Early Start of Construction may be rough grading of a specific portion of the Project, for which specific pertinent items of the design may include:

e. Horizontal and vertical drainage system;

f. Typical sections;

g. Related Elements of the drainage system;

h. Related Elements of the traffic control plan specifically applicable during the term of the Early Start of Construction scope;

i. Subsurface geotechnical investigations and recommendations;

j. Slope stability analysis and recommendations;

k. Preliminary structure general plans (if a structure is within the Element or portion of the nonstructural Work);

l. Settlement monitoring program; and

m. Construction specifications.

An Early Start of Construction shall be at the sole and complete risk of DB Contractor, and does not release DB Contractor from any of the requirements described in Section 2.2.6 (Construction Quality Management Plan). If, as a result of the review process, construction modification or changes to already completed Work Elements performed under the Early Start of Construction are required, DB Contractor shall make any and all construction modifications to already completed construction activities at its sole cost and expense without any entitlement to time extensions or adjustments in the Price.

2.2.5.9 Record Drawings and Documentation

Within ninety (90) Days of Final Acceptance of all or part of the Project, DB Contractor shall submit to TxDOT a complete set of Record Drawings in hard copy and native electronic format for the portion of the Project actually opened to traffic. The Record Drawings and documentation shall be an organized, complete record of plans and supporting calculations and details that accurately represent what DB Contractor constructed.

DB Contractor shall ensure that the Record Drawings reflect the actual condition of the constructed Work. DB Contractor shall submit to TxDOT the electronic files used to prepare the Record Drawings and documentation.

2.2.6 Construction Quality Management Plan

DB Contractor shall construct the Work in accordance with the Released for Construction Documents, following a reasonable timeframe for TxDOT and PSQCM review and comment, together with the relevant requirements and specifications of the DBA Documents.

DB Contractor's Construction Quality Management Plan (CQMP) shall contain detailed procedures for DB Contractor's quality control and quality assurance activities for construction activities. The CQMP shall be consistent with the applicable procedures contained in the current TxDOT *Contract Administration Handbook for Construction* and establish a clear distinction between quality control and quality acceptance activities and persons performing them. At a minimum, the CQMP shall specify:

a. Methods and procedures that clearly define the distinction/authority/responsibility for the administration of DB Contractor's CQMP;

b. That DB Contractor, Supplier, and Subcontractors designate an individual on each crew to be responsible for performing daily field inspections of their own Work and for preparing a daily QC report to document the inspection performed;

c. The review and approval of all Portland cement concrete and hot mix asphaltic concrete mix designs by a Construction Quality Acceptance Firm (CQAF) Registered Professional Engineer;

d. Methods and procedures to be utilized by DB Contractor to obtain active participation of the work force in quality control operations to achieve a quality project; reporting forms to be used by the responsible quality control personnel shall be included;

e. A construction quality control organization and staffing plan. The period of time that the quality control staff member will be present on the site shall be shown, resumes of the Key Personnel shall be included, and the experience/knowledge/skill levels of the quality control support staff shall be stated;

f. CQAF organizational and staffing plans. The period of time that the quality acceptance staff member will be present on the site shall be shown; resumes of key staff members shall be included; and the required minimum knowledge, technical skills, and experience level of the personnel related to the various inspection functions, such as grading, drainage, pile-driving, and structures inspections, that will occur on the Work shall be stated. The administrative/clerical support staff for maintenance and management of records/documents pertinent to quality acceptance for the CQMP activities shall be identified;

g. Procedures for inspecting, checking, and documenting the Work. Inspection, examinations, and measurements shall be performed for each operation of the Work to assure quality;

h. Procedures to ensure that all activities affecting the quality of the Work are accomplished under controlled conditions, using appropriate equipment for the task being performed;

i. Procedures to ensure that the education, training, and certification of personnel performing CQMP activities are achieved and maintained and that all Work is performed in accordance with the approved designs, plans, and specifications;

j. Procedures to ensure that critical Elements of the Work are not started or continued without inspection and testing by the quality acceptance personnel on site. Inspection or hold points shall be identified and communicated to the CQAF, CQAM, and TxDOT. Procedures to proceed beyond inspection points shall be developed;

k. Description of specific procedures to ensure that all Work conforms to the requirements of the DBA Documents, Governmental Approvals, and applicable Law, and the Design Documents, as well as that all materials, equipment, and Elements of the Work will perform satisfactorily for the purpose intended;

l. Documents specify that all activities undertaken by or on behalf of DB Contractor affecting the quality of the Work shall be prescribed and accomplished by documented instructions, procedures, and appropriate drawings. Such instructions, procedures, and drawings shall include quantitative and qualitative criteria to be used to determine compliance;

m. Measures to ensure that purchased materials, equipment, and services conform to the DBA Documents, and Governmental Approvals, applicable Laws, and the Design Documents. These measures shall be consistent with Good Industry Practice and shall include provisions for source evaluation and selection, objective evidence of quality furnished by Subcontractors and Suppliers, inspection at the manufacture or vendor source, and examination of products upon delivery;

n. Procedures for identification and control of materials, equipment, and Elements of the Work. These procedures shall be consistent with the Good Industry Practice to ensure that identification of the item is maintained by appropriate means, either on the item or on records traceable to the item, as necessary, throughout fabrication, erection, installation, and use of the item;

o. Procedures to ensure that materials, equipment, or Elements of the Work that do not conform to requirements of the DBA Documents, the Governmental Approvals, applicable Law, or the Design Documents are not used or installed. These procedures shall include identification, documentation, segregation, disposition, and notification to TxDOT and, if appropriate, Governmental Entities and other affected third parties, as well as procedures for TxDOT to review Nonconforming Work;

p. Procedures for processing a RFI to resolve discrepancies and/or questions in the plans and specifications so that all changes are documented and approved by DB Contractor's design engineers, PSQCM and TxDOT;

q. Procedures to indicate, by the use of markings such as stamps, tags, labels, routing cards, or other suitable means, the status of inspections and tests performed upon individual items of the Work;

r. A program of inspection for examination of the Work, measurement, and testing of materials or Elements of the Work to assure quality;

s. A program for coordination of all inspection and testing with the inspections and tests of Governmental Entities and Utility Owners;

t. A program to ensure performance of all testing required to demonstrate that all materials, equipment, and Elements of the Work will perform satisfactorily for the purpose intended and meet the standards specified in the DBA Documents. It shall specify written test procedures which include provision for ensuring that all prerequisites for the given test have been met and that adequate test instrumentation is available and used. The CQMP shall require test results be

documented and evaluated to ensure that test requirements have been satisfied. The CQMP shall also demonstrate how the CQAF will track its testing frequencies to ensure compliance with the DBA Documents;

u. Procedures for reviewing and approving acceptance test results, categorizing test results in a manner acceptable to TxDOT, transmitting acceptance test results to TxDOT in a format acceptable to TxDOT for use in fulfilling its statistical validation requirements, and working collaboratively with TxDOT to resolve statistical non-validation between CQAF and TxDOT test results;

v. Measures to ensure that tools, gauges, instruments, and other measuring and testing devices used in activities affecting quality are properly maintained, controlled, calibrated, certified, and adjusted at specified periods to maintain accuracy within industry standards;

w. Procedures to control the handling, storage, shipping, cleaning, and preservation of materials and equipment to prevent damage or deterioration;

x. Procedures to ensure those conditions adverse to quality, such as failures, malfunctions, deficiencies, defective material and equipment, deviations, and other Nonconforming Work are promptly identified and corrected. The procedures shall ensure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to TxDOT in writing and to appropriate levels of DB Contractor's management to ensure corrective action is promptly taken;

y. A comprehensive system of planned and periodic audits of DB Contractor's CQMP to determine adherence to and the effectiveness of the CQMP. CQAF personnel shall perform the audits in accordance with the written procedures or checklists. Audit results shall be documented, reviewed, and acted upon by DB Contractor. Follow-up action, including re-audit of deficient areas following corrective action, shall be taken where indicated;

z. Measures to control the receipt and issuance of documents, such as instructions, procedures, training manuals, and drawings, including changes thereto, which prescribe activities affecting quality. These measures shall ensure that approved documents, including authorized changes thereto, are reviewed for adequacy and approved for release by authorized personnel of DB Contractor and are distributed to and used at the location where the prescribed activity is performed. Changes to the documents shall be reviewed and approved by the same organizations that performed the original review and approval, unless TxDOT consents in writing, to another responsible organization;

aa. The requirements and methods for controlling documents. DB Contractor's document control system shall be compatible with TxDOT's;

bb. Procedures and personnel to be used to assure that specified instrumentation is installed and monitored in accordance with applicable specification;

cc. The form and distribution of certificates of compliance; and

dd. Procedures for quality acceptance in the CQMP, with respect to checking and verifying the accuracy, and adequacy of construction stakes, lines, and grades established by DB Contractor.

2.2.6.1 Personnel and Staffing

2.2.6.1.1 Construction Quality Control Manager

DB Contractor shall assign an on-site Construction Quality Control Manager (CQCM) who shall be responsible for management of the quality control aspect of the CQMP. The CQCM shall not be involved

with scheduling or production activities, and shall report directly to DB Contractor's management team. The CQCM shall see that the methods and procedures contained in the approved CQMP are implemented and followed by DB Contractor and Subcontractors in the performance of the Work. The CQCM shall be a qualified individual experienced in managing and overseeing all aspects of on-site construction quality control.

2.2.6.1.2 Construction Quality Control Staff

DB Contractor and Subcontractors' construction work force are all considered to be members of DB Contractor's quality control staff as each and every one is responsible for the quality of the Work. Personnel performing QC inspections shall ensure quality of workmanship and QC sampling/testing shall ensure that materials meet the required specifications prior to acceptance testing performed by the CQAF. Personnel responsible for performing quality control inspection shall be knowledgeable and receive training to perform their quality control duties. Personnel performing quality control sampling/testing shall be knowledgeable in the testing methods and procedures and do not need to be certified or direct employees of DB Contractor, but cannot be employees of the CQAF.

2.2.6.1.3 Construction Quality Acceptance Manager (CQAM)

DB Contractor's CQAF shall assign an on-site Construction Quality Acceptance Manager (CQAM) who shall be responsible for management of the quality acceptance aspect of the CQMP. The CQAM shall be a Registered Professional Engineer and shall be an employee of the CQAF. The CQAM shall report jointly to DB Contractor's management team and TxDOT. The CQAM shall not report to any person or party directly responsible for design or construction production.

The CQAM shall review, approve, authorize, examine, interpret, and confirm any methods or procedures requiring the "Engineers' review, approval, authorization, examination, interpretation, confirmation, etc." which are contained in the TxDOT standards.

2.2.6.1.4 Construction Quality Acceptance Staff

A quality acceptance inspection and material sampling/testing staff shall be provided under the direction of the CQAM to perform inspection and material sampling/testing of all Work performed and materials incorporated into the Project by any member of DB Contractor's group. If approved in writing in advance by TxDOT, qualified individuals who are employees of or retained by manufacturers, vendors or Suppliers may inspect certain portions of Work.

The quality acceptance inspection and testing staff shall be employees of the CQAF and shall have been trained in the applicable inspection and material sampling and testing procedures. The quality acceptance staff shall be experienced in highway inspection and material testing. The training and experience of the quality acceptance staff shall be commensurate with the scope, complexity, and nature of the activity to be controlled and tested. Qualifications shall include appropriate TxDOT or state highway agency certification for testing and inspection, as well, as nationally recognized certifications such as ACI certification in applicable inspection or testing activities. Construction quality acceptance staff shall report to the CQAM.

The quality acceptance staff shall provide oversight and perform audits of the quality control inspection and material sampling/testing operation.

The quality acceptance inspection staff shall check compliance of all material, equipment, construction, installations, and operations. Construction activities requiring continuous field quality acceptance inspection or sampling and testing, in the sole discretion of TxDOT, shall proceed only in the presence of assigned QA personnel. The CQMP shall identify those activities.

2.2.6.1.5 Construction Quality Acceptance Staff Levels

The size of the quality acceptance staff shall reflect the volume of quality acceptance activities necessary for the Work in progress and shall be maintained in accordance with the approved CQMP. The CQAF staff will perform quality acceptance oversight, inspection, and testing services typically performed by TxDOT on traditional projects, with the exception of monitoring testing.

The construction quality acceptance staffing requirements shall be updated as necessary throughout the Term of Work to reflect changes in the actual construction schedule. DB Contractor shall ensure that adequate construction quality acceptance staff is available and that CQMP activities are undertaken in a manner consistent with the Project Schedule and in a manner that will enable DB Contractor to achieve the Substantial Completion Deadline and Final Acceptance Deadline.

Should TxDOT determine that DB Contractor is not complying with the CQMP because of lack of staff, TxDOT shall have the right, without penalty or cost, including time extensions or delay damages, to restrict Work efforts until appropriate levels of staffing consistent with the CQMP and satisfactory to TxDOT are obtained, or TxDOT may contract with a separate firm to perform these services and withhold payment to DB Contractor for such services.

2.2.6.1.6 Responsibility and Authority of DB Contractor Staff

Personnel assigned to perform inspection, testing, or monitoring of characteristics for acceptance shall not be those personnel performing or directly supervising the Work being accepted.

DB Contractor's CQCM, CQAM, and quality staff shall have no responsibilities in the production of the Work. Quality acceptance staff shall remain independent of the quality control staff.

The CQCM shall prepare a monthly report of the quality inspections and tests performed, results of such inspections and tests, and occurrences and resolution of non-conformance discoveries. DB Contractor shall submit the monthly reports to TxDOT for review.

DB Contractor's CQCM and CQAM shall have the authority to stop Work for quality-related issues.

2.2.6.2 Inspection and Testing

The CQMP shall contain detailed descriptions of the inspection and test plans, including the timing, quantities represented and frequency of testing that DB Contractor will use to meet quality control and quality assurance requirements of the Work.

DB Contractor shall revise its Quality Management Plan when its own quality management organization detects a systemic or fundamental non-conformance in the work performed, in the manner the Work is inspected or tested, or when TxDOT advises DB Contractor of such a problem.

2.2.6.3 TxDOT Construction Notices

On a weekly basis, DB Contractor shall provide TxDOT with a rolling three (3) week inspection notice. The inspection notification shall include the fabrication schedule and planned construction activities for items where TxDOT is performing the fabrication inspection.

2.2.6.4 Reporting, Recordkeeping, and Documentation

DB Contractor shall develop and maintain inspection and testing records that include, but are not limited to:

a. Quality control inspection reports and process control material sampling/testing results and control charts shall be submitted to TxDOT within twenty-four (24) hours following the inspection or test;

b. The CQAF shall maintain, electronically, a daily log of all inspections performed for both DB Contractor and Subcontractor operations in a format acceptable to TxDOT and transmitted to TxDOT daily. The daily inspection reports shall identify inspections conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed. The responsible technician and supervisor shall sign the daily inspection reports. The results of the daily inspections shall be provided to TxDOT in an electronic format within twenty-four (24) hours after the work shift;

c. The CQAF shall be responsible for establishing an electronic system for recording all material test results. The responsible technician and his/her supervisor shall sign the daily test reports. The results of the daily test shall be provided within one (1) Day of test completion; and

d. The CQAF's inspection and materials quality program shall electronically deliver the laboratory and field test results to TxDOT in the database format provided in Attachment 2-3 (I2MS Test Field Forms). This electronic reporting is intended to allow DB Contractor and TxDOT to make timely and accurate decisions on workmanship and material quality issues.

2.2.6.5 Laboratory Requirements

DB Contractor shall perform testing in accordance with, but not limited to:

a. Quality acceptance tests shall be conducted by the CQAF's testing laboratory identified in the Construction Quality Management Plan (CQMP) that complies with the requirements of the AASHTO Accreditation Program (AAP) or other appropriate accreditation acceptable to TxDOT for the pertinent test. A copy of AAP accreditation certificate(s) shall be transmitted to TxDOT upon their receipt by the testing laboratory; and

b. Equipment in all laboratories shall be certified prior to commencing any construction activities and shall retain the certification by AASHTO, or TxDOT, as applicable for the duration of the Work.

2.2.6.6 Supply Source and Material Quality

Quality of all materials shall conform to requirements contained in the DBA Documents and to any requirements of affected Utility Owners. The CQAF shall provide plant inspection and aggregate sampling and testing at concrete and asphalt plants. Manufacturers' test reports may supplement, but not replace, the QA inspections, sampling, testing, and certification provisions.

2.3 Public Information and Communications Plan

DB Contractor shall submit to TxDOT for approval a Public Information and Communications Plan (PICP), in accordance with Attachment 2-1 (Project Management Plan Contents) and the requirements set forth in Section 3.2.1, that is consistent with and expands upon the preliminary communications plan submitted with the Proposal and TxDOT/DB workshop. DB Contractor shall maintain and update the PICP throughout the Term.

The PICP shall describe the procedures for communication of Project information between DB Contractor's organization and TxDOT. Section 3 (Public Information and Communications) includes requirements for developing and implementing the program in coordination with TxDOT.

The PICP shall describe how DB Contractor's organization will respond to unexpected requests for information, communicate changes or revisions to necessary DB Contractor personnel, and notify affected stakeholders before and after changes are made to the DBA Documents.

2.4 Safety and Health Plan

DB Contractor shall be responsible for the safety and health of its personnel and of the general public affected by the Project. DB Contractor shall prepare and submit to TxDOT for approval a comprehensive Safety and Health Plan ("Safety and Health Plan") that is consistent with and expands upon the preliminary safety and health plan submitted with the Proposal. All members of DB Contractor's team shall adhere to DB Contractor's Safety and Health Plan. DB Contractor shall meet the following Safety and Health Plan content and preparation requirements.

DB Contractor shall take full account of the unique attributes of this Project in preparing the Safety and Health Plan, including but not limited to, the urban environment, the heavy traffic conditions and the size and scope of the Project. The Safety and Health Plan shall fully describe DB Contractor's policies, plans, training programs, Work Site controls, and Incident response plans to ensure the safety and health of personnel involved in the Project and the general public affected by the Project. The Safety and Health Plan shall cover all phases of the Work, and DB Contractor shall review, evaluate, and update such Plan as often as necessary to reflect relevant changes during the Term of the DBA. The Safety and Health Plan shall contain, at a minimum, the following provisions:

a) Safety Management

DB Contractor shall identify the personnel and responsible staff who will implement, maintain, and enforce the Safety and Health Plan policies, plans and training programs in the Safety and Health Plan. At a minimum, DB Contractor shall provide a full time on-the-job Safety Manager. The Safety Manager's qualifications, at a minimum, shall include:

- Roadway construction and safety enforcement experience;
- Ten (10) years of progressive heavy construction experience, five years of which must be safety management experience on complex heavy civil projects;
- Designation, at or before the Effective Date, as a Construction Health and Safety Technician (CHST) by the Board of Certified Safety Professionals (BCSP), or designation as a Certified Safety & Health Official (CSHO), either of which may be substituted for two years of safety management experience (CHST and CSHO certifications are not required if the Safety Manager has at least 5 years of safety management experience);
- Completion of the OSHA #500 course – Trainer Course in OSHA Standards for Construction;
- Training and current certification for CPR and First Aid; and
- Completion of the following training sponsored by an accredited agency:
    - Work zone traffic control
    - Flaggers in work zones.

The Safety Manager shall report directly to the Project Manager's supervisor or other executive employee with authority over the Project but removed from the design and construction of the Project. The Safety Manager shall have authority to stop all Work on the Project.

In addition, DB Contractor's safety management team shall also have the minimum additional personnel. As part of DB Contractor's safety and health management, all Work shifts shall have, as a minimum, an on-Site Shift Safety Representative. The Shift Safety Representative shall have the following minimum qualifications:

- Three (3) years of progressive safety experience and general competency in the construction safety disciplines related to the Work;

- Completion of the OSHA 10-hour Safety and Health Course; and
- Training and current certification for CPR and First Aid.

The Safety and Health Plan shall define the role and responsibilities of the Safety Manager and safety staff, the hierarchical relationship between the Safety Manager and other managers, supervisors, and employees, and how responsibility and accountability for safety will be incorporated at all levels on the Project.

The Safety and Health Plan shall set forth the obligations of all personnel in adhering to the Safety and Health Plan, as well as establish and communicate clear goals for safety, security, and health, including defined objectives for meeting the goals. Requirements for evaluating the effectiveness of policies and measuring success in meeting the goals and objectives of the Safety and Health Plan shall be set forth in the Safety and Health Plan and an environment and means for continuous evaluation and improvement shall be established to achieve the Safety and Health Plan goals and to identify deficiencies so that the goals and objectives can be revised as needed to improve the safety and health of DB Contractor's personnel and of the general public affected by the Project.

The Safety and Health Plan shall set forth incident response plans to ensure the safety and health of personnel involved in the Project and the general public affected by the Project. In addition, the Safety and Health Plan shall set forth procedures for immediately notifying TxDOT of all incidents arising out of or in connection with the performance of the Work, whether on or adjacent to the Project.

b) Worksite and Jobsite Analysis

The Safety and Health Plan shall establish a reliable system for allowing employees to notify management personnel about conditions that appear hazardous, and to receive timely and appropriate responses, without fear of reprisal.

DB Contractor shall keep readily available at DB Contractor's Project office site an updated summary of Work related incidents, which may include, at a minimum, a board promoting the number of consecutive incident-free days.

c) Hazard Prevention and Personal Safety

The Safety and Health Plan shall set forth (a) the methods and procedures to identify and detail all hazards that may be encountered by personnel while performing the Work, and (b) practices and procedures that have been developed and implemented to address prevention of identified hazards. DB Contractor shall establish a communications protocol to ensure all employers and employees are aware of hazards in all areas and how to deal with them appropriately. Means shall be provided to evaluate all anticipated and unanticipated activities, and address potential hazards related to these activities.

DB Contractor shall provide the means to ensure personnel understand and comply with safe work practices and procedures through training, positive reinforcement, correction of unsafe performance, and if necessary, enforcement through a clearly communicated disciplinary system established within the Safety and Health Plan.

DB Contractor shall handle Hazardous Materials in compliance with Section 6.9 of the DBA and the applicable requirements of the Technical Provisions.

d) Training

DB Contractor shall establish methods within the Safety and Health Plan to identify, develop, and provide relevant training for employees and supervisors designed to ensure that all employees understand and are aware of the hazards to which they may be exposed, and are aware of the proper methods for avoiding the hazards.

DB Contractor shall establish methods within the Safety and Health Plan to identify, develop, and provide supervisory training programs to ensure supervisors understand the key role they play in job site safety and to enable them to carry out their safety and health responsibilities effectively; to analyze the work under their supervision to anticipate and identify potential hazards; and to maintain physical protection in their work areas, including the establishment of policies that ensure each employee is provided with the equipment necessary to complete assigned tasks safely.

The Safety and Health Plan shall set forth the procedures to plan and prepare for Emergencies, and to conduct training and Emergency drills.

e) Drug Free Work Zone

The Safety and Health Plan shall set forth the policies and procedures to require adherence to a 100% drug/alcohol free work zone.

f) Incident and Emergency management

DB Contractor shall establish procedures within the Safety and Health Plan to achieve at a minimum, the following:

- Maintenance of communication for the exchange of information between DB Contractor, TxDOT, and other involved agencies.
- Coordinated support through interaction with local, State, and federal governmental entities, as well as other entities, for safe and efficient construction.
- Discussion and coordination with Emergency response, traffic control, security, and operational issues affecting construction of the Project, and associated system feeders and exits.
- Procedures to update participating agencies regarding status of construction of the Project, and associated system feeders and exits, to assure safe and timely response to Emergency events. As a minimum, this shall include off-Site and on-Site traffic routing changes, and changes to Site access, fire suppression system modifications and in-service availability of standpipes or fire suppression water supply, if applicable, and changes in the Work that may create a greater likelihood of occurrence of a particular type of Emergency.
- Compliance with the Local Hurricane Evacuation Plan.

2.5 Comprehensive Environmental Protection Plan

Section 4 (Environmental) includes requirements for environmental management.

2.6 Risk Management Plan

The Risk Management Plan shall describe the approach to identification, management, mitigation and allocation of Project-specific risks, including a risk matrix which shall identify the following at a minimum:

a) Significant risk categories during the design and construction of the Project;

b) The potential consequences of the identified risks;

c) The probable likelihood of risks;

d) Proposed procedures and tools to conduct a risk sensitivity analysis;

e) Risk-mitigation strategies to eliminate or reduce specific risks.

The Risk Management Plan shall be updated throughout the project as risks are retired or as additional risks are realized.

Attachment 2-1 (Project Management Plan Contents) includes requirements for risk management.

2.7 Right of Way (ROW) Acquisition Plan

TxDOT has acquired some of the ROW required for the Project. If DB Contractor chooses to alter the roadway alignment in such a manner requiring additional ROW, DB Contractor shall be responsible for the acquisition cost for such parcels. DB Contractor shall provide all services necessary to acquire title to the additional ROW, in form and substance acceptable to TxDOT, in the name of the State; relocation of displacements; and clearance/demolition of the improvements from the Project ROW.

Section 7 (Right of Way) includes the requirements for ROW acquisition management.

2.8 Traffic Management Plan

Section 18 (Traffic Control) includes requirements for traffic management.

2.9 Maintenance Management Plan

Section 19 (Maintenance) includes requirements for maintenance management.

3 PUBLIC INFORMATION AND COMMUNICATIONS

3.1 General Requirements

The objective of the Public Information and Communications Program is to maintain a high level of two way communication by informing and engaging local Governmental Entities, special interest groups, businesses, communities, and the general public about the Project status throughout the design and construction period.

DB Contractor shall be responsible for developing and implementing the program in coordination with TxDOT. DB Contractor shall coordinate all public information communications with ongoing TxDOT public information activities to ensure that a consistent message is being distributed to the Customer Groups, as defined below in Section 3.2.4 of these Technical Provisions.

DB Contractor shall meet regularly, on a mutually agreed upon schedule, with TxDOT public information officer to coordinate efforts. Consideration should be given to the Authority in the planning and implementation of the program.

Copies of all materials to be presented to the public or the media shall be provided to TxDOT at least three (3) Business Days prior to dissemination.

3.2 Administrative Requirements

3.2.1 Public Information and Communications Plan

DB Contractor shall submit to TxDOT for approval a comprehensive Public Information and Communications Plan (PICP) within 30 days after issuance of NTP1, based upon the preliminary public information and communications plan submitted with DB Contractor's Proposal, which informs, educates, and engages the Customer Groups throughout every stage of the Project. TxDOT and DB Contractor shall jointly organize a communications planning workshop (TxDOT/DB workshop) to discuss development of the PICP and to ensure the contents of the draft PICP meet TxDOT expectations. TxDOT and DB Contractor will jointly develop a draft agenda and determine a suitable location for the workshop

DB Contractor shall obtain TxDOT approval of the PICP as a condition precedent of NTP2. The PICP shall identify specific outreach or engagement activities, the frequency of those activities, what modes of communication will be used and what process DB Contractor will use in order to measure the effectiveness of the PICP. Submittal shall be in both hardcopy form and electronic format compatible with TxDOT software.

In preparing this plan, DB Contractor shall identify the Customer Groups and develop specific plans to respond to their concerns and needs in all respects regarding the Project. After incorporation of comments from TxDOT on the PICP, DB Contractor shall implement the various activities and initiatives contained therein. DB Contractor shall continually maintain the plan to ensure delivery of high-quality, well executed communications throughout the Term of the DBA.

The PICP shall be flexible to capture the full magnitude of yet-to-be-determined impacts from Project activities and the public's reaction to these and other impacts. Together with TxDOT's designated point of contact for the local public information office, DB Contractor shall periodically review the PICP on a basis not less than annually to forecast, plan and coordinate updates in the plan, and strategies needed to effectively accomplish the stated goals and objectives. The PICP shall also be resilient to successfully implement the outlined strategies, given the ever-changing desire for depth, breadth, and frequency of information by a variety of important Customer Groups such as the media, elected officials, and the general public.

The PICP shall include a general timeline listing public information activities for the Project over the entire Term of the DBA. This timeline shall be used as an initial guide and shall be updated by DB Contractor as the Project is implemented but no less than on a yearly basis.

TxDOT may audit DB Contractor's performance of the activities set forth in the PICP. DB Contractor shall make appropriate changes to the PICP as required to meet the findings of any audit or review and to suit the changing goals and needs of the Project. DB Contractor shall cooperate with TxDOT to amend the PICP as required to suit circumstances as yet unknown, including public reaction to the impacts, real or perceived, from the Work and the depth, breadth and frequency of information necessitated by Customer Groups. DB Contractor shall document the efforts and results of the PICP in measurable terms to clearly indicate compliance.

DB Contractor shall provide sufficient qualified staffing to effectively implement the PICP.

In developing the PICP, DB Contractor shall develop appropriate provisions to achieve the following goals:

a. Gain and maintain support and/or informed consent from Customer Groups, building on existing community partnerships and communication networks.

b. Provide Customer Groups with regular opportunities for input early and often throughout the development process.

c. Demonstrate to Customer Groups that the Project will be developed pursuant to a well-executed program.

d. Notify Customer Groups in advance of key Project ROW acquisition, construction and maintenance activities and communicate the potential impacts of these activities.

e. Provide public information which facilitates alternative trip planning during construction.

Address the Project-specific concerns of Customer Groups, including but not limited to interests in Emergency Services vehicle access, business owner and patron driveway access, delivery access, adjacent neighborhood access, changes to bicycle and pedestrian access and neighborhood traffic patterns, changes to mobility access associated with the *Americans with Disabilities Act* (ADA), construction noise and lighting, and ongoing noise issues.

To achieve these goals, DB Contractor shall use, but not be limited to, the following implementation strategies:

Public Information and Communication Strategies

a. Develop a forum to coordinate on-going dialogue among Customer Groups, TxDOT, and DB Contractor.

b. Prepare and distribute Project-related materials in a user-friendly format to inform Customer Groups through appropriate means such as: meetings, business owner task force meetings, interviews, website, media kits, news releases, telephone correspondence, newsletters, brochures, e-mail, text messaging service, social media, mobile phone apps, hotlines, Highway Conditions Reports (HCRs), dynamic message boards, Web alerts, public opinion polls/surveys, videos, display booths, presentations, public access information kiosks, open houses, milestone events and special events.

c. Organize and manage meetings and communications with key elected officials, the general public, representatives of civic organizations, businesses, and special interest groups along the Project corridor (individually or in groups) for the purpose of building rapport and gaining

feedback with Customer Groups. Meetings can be held on an ad hoc basis or, as appropriate, on a regular basis as established in consultation with TxDOT.

d. Respond to invitations and seek opportunities to attend meetings, conferences, and other events at which Project information can be exchanged with Customer Groups.

e. Notify Customer Groups in advance of key Project ROW acquisition, construction, operations and maintenance activities, and communicate the potential impacts of these activities.

f. Develop, disseminate and display timely, high-quality, innovative, user-friendly, accurate and appropriate community information concerning the Project, including exhibits showing slope grading, drainage, bridge structures, retaining walls, noise walls, Project ROW acquisition, and aesthetic characteristics.

g. Develop and manage a public relations campaign and communication strategy to convey key messages, branding, and pertinent information about the Project.

h. At appropriate times and stages and as requested by TxDOT or key stakeholders, coordinate tours of the Project.

i. Comply with the latest requirements of the TxDOT Guidelines for Analysis and Abatement of Roadway Traffic Noise.

j. Develop materials and make arrangements for multi-lingual groups when it can be reasonably anticipated that material will be presented to multi-lingual Customer Groups.

k. Communicate impacts and Ultimate Project design for accommodation of pedestrians and bicyclists throughout the Project.

l. Conduct tabletop exercises with stakeholders and government agencies to help prepare for potential emergency situations during construction phase.

m. Compile database of all customer group contacts and make readily available to TxDOT in an easily accessible format.

Media

a. Build on existing TxDOT media resources and/or create and develop advertising messages, including graphics, logos, and slogans.

b. Place Project-related messages in the appropriate media.

c. Develop and distribute public service announcements, paid advertising, news reports, and other communication materials as appropriate.

d. Manage media relations with key transportation and business reporters and prepare and distribute news releases and media kits.

e. Develop and implement communications plans that anticipate and attempt to minimize traffic impacts of public, special and seasonal events adjacent to the corridor that may draw large crowds through the Project.

f. Monitor local, state, and national media coverage for accuracy and to gauge local opinion. Coordinate with TxDOT regarding response to inaccurate information as soon as possible in the same media.

g. Document and provide Project-specific media clips to the entire Project team.

h. Facilitate Project tours.

Environmental

The PICP shall detail the communication hierarchy for information distribution related to compliance with the Comprehensive Environmental Protection Program, as described in Section 4. The PICP shall include names and contact information, including emergency contact information, and the preferred methods of routine, and emergency communication distribution.

DB Contractor shall assign audit and quality assurance responsibilities to a member of his quality assurance team. The Public Information Coordinator shall not perform those duties because of the potential conflict of interest.

3.2.2 Public Information Coordinator

DB Contractor shall provide a Public Information Coordinator to lead DB Contractor's responsibility for public involvement activities on a day-to-day basis throughout the Term of the DBA. The Public Information Coordinator shall have a minimum of four years of relevant experience on projects of similar type and scope, and the ability to competently perform the following:

a. Serve as the primary point of contact between DB Contractor and Customer Groups and act as clearinghouse for the receipt of and response to written or verbal comments or complaints regarding the Project.

b. Lead the production, implementation, audit, quality control/quality assurance, and update of the PICP.

c. Coordinate and supervise day-to-day activities of DB Contractor's personnel in performing the activities described in the PICP.

d. Facilitate communication among DB Contractor, TxDOT personnel (including TxDOT's public information officers), and Customer Groups.

e. Interact with Customer Groups and represent the interests of the Project at associated meetings and other formal and informal events.

f. Develop a "first-hand feel" for Customer Groups' concerns and reactions regarding the Project and public information program and incorporate that knowledge into improving the PICP.

g. Liaise with the person assigned to coordinate the initial response to any Incident or Emergency and any Governmental Entity that may have jurisdiction in the Emergency.

h. Liaise with the appropriate staff and customer groups as appropriate to outline the impacts and benefits of the Project in relation to parks and pedestrian/bicyclist access.

i. Create and manage a Customer Group database. Allow TxDOT access to database as needed.

j. Coordinate with the TxDOT Fort Worth District Public Information Officer (PIO) with all media inquiries and outreach.

3.2.3 Public Information Office

DB Contractor shall maintain a public information office for the Term of the DBA. The hours of operation for this office shall be as outlined below. This office shall serve as the primary business location for the Public Information Coordinator and shall be conveniently located to the Project site. The public information office shall facilitate the exchange of information between DB Contractor and the public and provide a centralized location for residents and other Customer Groups to obtain information on the Project, including Project maps and Plans, fact sheets, alternative routes, lane closures, construction updates, community impacts, and commute options.

The public information office shall have readily available two conference rooms capable of hosting Customer Group meetings. The rooms shall be ADA-compliant, convenient to and accessible by

Customer Groups, and appropriately supplied with electrical outlets, tables and chairs, and other basic equipment to meet meeting requirements. One of these rooms shall accommodate at least 50 persons and another shall accommodate at least 15 persons. DB Contractor shall provide sufficient parking to accommodate use of the public information office.

During major construction, the minimum hours of operation of the public information office shall be as follows.

Monday-Friday	8 a.m. – 5 p.m. and by appointment
Saturday	By appointment
Sunday	Closed

DB Contractor shall extend hours of operation to appropriately service Customer Groups.

DB Contractor shall provide reasonable access to the Project site to give TxDOT-approved Customer Groups the opportunity to view the construction.

In addition to the services listed above, DB Contractor shall provide a 24-hour telephone hotline that is manned during the public information office's normal business hours and that provides a recorded message describing Emergency procedures after hours. DB Contractor shall respond to voicemail messages left after hours within 24 hours of receiving the voicemail message.

3.2.4 Customer Groups

The Public Information Coordinator shall actively engage, inform, and seek appropriate support from Customer Groups for the Project throughout every stage of the Project. Customer Groups shall include the following:

a. Media

b. Local, State, and Federal Governmental Entities including regulatory and law enforcement agencies

c. General public residing or working within the general vicinity of the Project or traveling within or across the limits of the Project

d. Business owners within or adjacent to the Project corridor

e. Utilities, railroads, transportation authorities, and providers (such as local airports, transit operators, toll authorities, and other highway concessionaires) affected by the Project

f. Neighborhood associations, community groups, and other organizations with special interest in the Project

g. Major traffic generators that could be affected by closures or construction (such as universities, hospitals and major employers) and sponsors/coordinators of major regional special events such as Super Bowls.

Stakeholders will be added to this list as the Project progresses.

3.2.5 Public Meetings

DB Contractor shall organize and manage public meetings with the Customer Groups during design and construction activities and will serve as the clearinghouse for invitations to attend meetings and other events.

The frequency of public meetings shall be addressed in DB Contractor's PICP and will increase or decrease as needs arise to better inform and engage the Customer Groups. DB Contractor shall propose a

schedule of public meetings to TxDOT and then conduct the public meetings that, at a minimum, shall address Project construction and maintenance.

To maximize public participation, DB Contractor shall advertise public meetings with sufficient advance notice via e-alerts, social media, and its website and in the appropriate media outlets, such as the Texas Register, local newspapers, and television and radio stations, or via media advisories and media releases as appropriate. DB Contractor shall be solely responsible for meeting advertisement except that the Texas Register advertising, when appropriate, shall be routed through TxDOT's Public Information Office.

During such meetings, DB Contractor shall inform the participants of the Project's progress and discuss key issues as they emerge. DB Contractor shall provide timely and useful information regarding subjects of interest to the Customer Groups, including:

a. Design and construction issues affecting adjacent residential areas, frontage roads, local streets, and utilities, including such issues as Project ROW definition, Project ROW acquisition process, grading, drainage, access, lighting, aesthetics and noise, and retaining walls

b. Street and roadway detour design and implementation

c. Scheduling and duration of Work, including hours of construction

d. Haul routes

e. Methods to minimize noise and dust

f. Environmental mitigation measures, including noise wall meetings

g. Other environmental issues

h. Tolling plans and ingress and egress points to the managed lanes

i. DB Contractor shall conduct a ROW open house at the direction of TxDOT and invite all affected and potentially affected property owners

DB Contractor shall notify TxDOT a minimum of 48 hours in advance of any meetings with the public. TxDOT reserves the right to attend any such meetings. When requested by TxDOT, DB Contractor shall participate in and provide support for any meetings with the Customer Groups called and conducted by TxDOT. When TxDOT decides to conduct such meetings, DB Contractor shall share, in a readily manipulative form, all necessary information regarding potential Customer Groups at TxDOT's request. DB Contractor shall bear all costs associated with the meetings organized and managed by DB Contractor.

3.2.6 Meeting Summaries

For all meetings which DB Contractor conducts or directly participates in, DB Contractor shall prepare meeting summaries within five (5) Business Days after the conclusion of such meetings. At a minimum, DB Contractor shall include the following items in the meeting summary:

a. A complete list of attendees (including their affiliations, telephone numbers, and e-mail addresses)

b. Documentation of the exhibits, presentations and/or handouts available at the meeting

c. Documentation of the issues discussed and any associated solutions

d. Description of remaining open issues and action items (including the person(s) responsible for follow-up and target date for resolution)

For any formal public meetings or open houses at which a court reporter is required, DB Contractor shall also include detailed verbal transcripts in the summary. DB Contractor shall submit draft versions of all

meeting summaries to TxDOT for review before distributing final versions to the meeting attendees and appropriate Customer Groups.

Meeting summaries shall be submitted to TxDOT in readily accessible form (e-mail, Project intranet site, or file sharing site) within five (5) Business Days.

3.2.7 Emergency Event Communications

For all Emergency events, such as major vehicle collisions, ice/snow conditions, and Hazardous Material spills, the Public Information Coordinator shall take timely and appropriate action to inform TxDOT and appropriate Customer Groups of all pertinent details. The Public Information Coordinator shall provide these details through the use of appropriate tools to ensure effective communication. These tools include, but are not limited to: dynamic message signs (DMS), TxDOT's Highway Conditions Report, TxDOT Dallas District Office Highway Advisory Report, email/Web/text alerts, telephone notification, facsimiles, and media releases/interviews, as appropriate. The Public Information Coordinator shall continue to provide updated information, as available and on a timely basis, until the Emergency no longer exists.

In the event of an unforeseen Emergency, timely notification shall mean as soon as practicable, but in no event longer than within one hour of the occurrence. The definition of an unforeseen Emergency shall follow TxDOT's general guidelines requiring emergency notification when delays for motorists in traffic extend beyond two (2) hours. If advanced warning is available for an Emergency event such as ice/snow, timely notification shall mean as soon as practicable, but in no event longer than within one hour of the time the information is available. In both situations, the Public Information Coordinator shall continue to provide updated information, as available and on a timely basis, until the Emergency no longer exists.

3.2.7.1 Lane Closures

Subject to the lane closure restrictions set forth in Section 18, DB Contractor shall provide TxDOT and appropriate Customer Groups a minimum of two weeks advance notice for lane closures and/or traffic switches planned to be in effect longer than 24 hours, or all full highway closures in effect during any portion of the period from 6 a.m. to 8 p.m., regardless of duration, and a minimum of 48 hours advance notice for lane closures other than full closures that are planned to be in effect less than 24 hours, using all appropriate tools as needed. The Public Information Coordinator shall input all lane closures (or an event that results in lane closures) into the TxDOT Highway Conditions and Reporting System (HCRS).

For planned lane closures and Emergency event lane closures, as appropriate, DB Contractor shall coordinate lane closures that may affect crossing TxDOT facilities with appropriate TxDOT district and area offices, as needed, to ensure that no conflicts occur. DB Contractor shall provide advance notification of all lane closure notices to the appropriate TxDOT district and area office. TxDOT will provide appropriate contacts and information upon request. DB Contractor shall also monitor and work with other projects along the SH 360 corridor for major closures to minimize impacts to the traveling public.

3.2.7.2 Disseminating Public Information

DB Contractor shall prepare and distribute materials regarding Project-related subjects, using all appropriate methods, including, but not limited to: meetings, news releases, telephone correspondence, newsletters, emails, text messages, mobile phone applications for iPhone, Android, and Blackberry devices., hotlines, Highway Conditions Report, dynamic message signs, Web alerts, maps, displays, renderings, presentations, milestone events, business owner taskforce meetings, open houses, brochures, pamphlets, highway advisory radio, and video news releases. Copies of draft public information materials shall be submitted to TxDOT. TxDOT shall have a period of seven (7) days to review and comment in advance of final editing. Copies of all final materials shall be provided to TxDOT at least three days prior to dissemination.

DB Contractor shall create a public website to convey Project-related information, including, but not limited to:

a. Contact information
b. Project maps
c. Frequently asked questions (FAQs)
d. Current Project activities addressing design, construction, and maintenance
e. Timing of street and ramp closures and openings
f. Recommended route alternatives during closures
g. Newsletter and meeting materials
h. Meetings and special events announcements and calendar
i. Links to TxDOT Highway Conditions Reports
j. Links to other related sites as deemed appropriate by TxDOT
k. Information on TxTags, TollTags and a toll calculator
l. Job opportunities
m. Subcontractor information
n. Comment form
o. Mailing list request form
p. Historical archive of photos taken during construction
q. Renderings or video animations of the Ultimate Project, as appropriate
r. Published materials in Spanish or other languages as needs warrant, as well as TxDOT advised translated materials

The website shall also contain other general Project-related information that enhances the engagement or education of the general public. DB Contractor shall regularly review and update information on this public website throughout the Term of the DBA to provide current and appropriate information and the website shall provide for question and feedback opportunities for public communication. DB Contractor shall develop and implement a plan to make the Customer Groups aware of the Project website.

All written materials produced for Customer Groups shall follow the TxDOT *Style Guide* and/or other appropriate spelling/writing guidelines.

DB Contractor, working collaboratively with TxDOT, shall assess the need for multi-lingual communications and, where appropriate, furnish Project-related materials in Spanish or other demographic adaptations.

DB Contractor shall track all incoming comments and inquiries and requests for information related to the Project. The following information shall be collected with each contact, and a summary of all contacts without contact information shall be reported to TxDOT on a monthly basis:

a. Name of individual
b. Address (not required)
c. Phone number
d. E-mail address

e. Subject matter

f. Specific comment, question or request

g. Date of comment, question or request

h. Response given

4 ENVIRONMENTAL

4.1 General Requirements

DB Contractor shall deliver the environmental commitments required by the RFP, DBA Documents, Environmental Laws, Governmental Entities, Governmental Approvals, and all applicable federal and state Laws. To that end, DB Contractor shall develop, operate, and maintain a Comprehensive Environmental Protection Program (CEPP) for the Work to ensure environmental compliance with all applicable Environmental Laws and commitments. The CEPP shall obligate DB Contractor to protect the environment and document the measures taken during the performance of the Work to avoid and minimize impacts on the environment from the design, construction, maintenance, operation, and rehabilitation activities of the Project.

The CEPP shall be designed to incorporate all features and guidelines of ISO 14001. The CEPP shall effectively demonstrate in detail DB Contractor's knowledge of all applicable Project-specific Environmental Approvals, issues, and commitments and applicable Environmental Laws including those set forth in these Technical Provisions, and shall describe the processes that will be followed during the course of the Work to comply with those Environmental Approvals, issues, and commitments and Laws, as well as the documentation required to validate compliance. All monitoring and reporting activities shall be concise, and consistent throughout the Term of the DBA and shall be applicable to the activities being performed, and in accordance with the requirements set forth in the DBA Documents, the Environmental Approvals and applicable Environmental Laws. The program shall also effectively describe the quality control and assurance measures that DB Contractor will implement to verify the compliance of the program with all applicable Environmental Laws.

The CEPP shall establish and implement environmental permits, issues, and commitments consistent with the Environmental Approvals. The CEPP shall establish a goal of zero environmental violations during the performance of all Work activities. However, should violations occur, the CEPP shall set forth detailed processes for rectifying such violations in an appropriate and timely manner.

DB Contractor shall cause Work to comply with Environmental Approvals and compliance requirements for any additional actions throughout the Term of the DBA. DB Contractor shall monitor and document Work activities so that documents providing evidence for compliance are available to TxDOT for inspection at any time.

The costs of all field laboratory and consulting work, including but not limited to Phases II to III environmental site assessments are included in the Price. In no event shall DB Contractor be entitled to any additional compensation for any Hazardous Materials investigation costs.

4.2 Environmental Approvals

4.2.1 New Environmental Approvals and Amended TxDOT-Provided Approvals

TxDOT-Provided Approvals are based on the design features illustrated in the Ultimate Project schematic and as presented in the National Environmental Policy Act (NEPA) Environmental Assessment and Finding of No Significant Impact (FONSI) documents. Initial phase improvements associated with the Project will be constructed based on the Basic Configuration as shown on the Base Scope Schematic. Such approvals may require re-evaluation, amendment, or supplement as the Work progresses in order to accommodate actions not identified in the Environmental Approvals or covered specifically by existing resource agency coordination. Changes to the Project Base Scope Schematic or incorporation of Additional Properties into the Project shall require the validity of existing Environmental Approvals to be

reassessed and may require new Environmental Approvals. A document containing a summary of the NEPA commitments and mitigation measures is provided in Attachment 4-1(EA Commitments).

DB Contractor shall be responsible for coordination with Governmental Entities necessary to obtain new Environmental Approvals or amendments to the TxDOT-Provided Approvals except where TxDOT has agreements with Governmental Entities to perform such coordination. As a courtesy, DB Contractor is required to extend an invitation to TxDOT for any meetings with Governmental Entities to discuss changes to the Project NEPA and permit documents.

DB Contractor shall be responsible for ensuring compliance with the conditions and schedules set forth in amendments to any TxDOT-Provided Approvals or new Environmental Approvals. TxDOT may, at its discretion, provide assistance in securing new Environmental Approvals or amendments to TxDOT-Provided Approvals at the expense of DB Contractor.

4.2.2 Responsibilities Regarding Environmental Studies

DB Contractor shall be responsible for conducting continuing environmental studies based on the Project approved NEPA document and Project Base Scope Schematic.

DB Contractor shall be responsible for conducting environmental studies and re-evaluations caused by actions not identified in the Environmental Approvals, actions not covered specifically by existing resource agency coordination, or incorporation of Additional Properties into the Project. DB Contractor shall be responsible for all coordination of environmental studies with appropriate Governmental Entities, except where TxDOT has agreements with Governmental Entities to perform such coordination. As a courtesy, DB Contractor is required to extend an invitation to TxDOT for any meetings with Governmental Entities to discuss changes to the Project NEPA and permit documents.

4.2.3 TxDOT Review and Approval of DB Contractor Submissions

TxDOT reserves the right to review, comment on, require revisions to, and reject for resubmission documentation submitted for environmental compliance or Environmental Approvals. Documentation shall conform to current TxDOT submission standards and the requirements of all applicable Governmental Entities and applicable Laws. TxDOT shall return approved documentation to DB Contractor for submittal to the appropriate Governmental Entity in cases where DB Contractor performs coordination. TxDOT, acting reasonably, shall approve those submissions for which TxDOT signature or other approval is required. TxDOT approvals of such submissions are not subject to a fourteen (14) day review and approval. Documentation not meeting current submission standards or requirements of Governmental Entities will be returned to DB Contractor, and shall be revised by DB Contractor to meet standards or requirements.

4.2.4 TxDOT-Provided Approvals

The TxDOT-Provided Approvals are:

- Finding of No Significant Impact (FONSI) issued by the Federal Highway Administration for the Project on January 16, 2014.

4.3 Comprehensive Environmental Protection Program

As part of the PMP, DB Contractor shall develop and implement a CEPP, applicable throughout the Term of the DBA to establish the approach, requirements and procedures to be employed to protect the environment. The CEPP shall be developed in the form of a comprehensive environmental management program incorporating all features and guidelines outlined in ISO 14001. All component parts shall reflect in order of priority: impact avoidance, minimization and as last resort compensation. The CEPP

shall satisfy applicable FHWA, TxDOT and resource agency requirements, including those detailed as commitments in any Environmental Approvals.

The CEPP shall be the overarching program by which DB Contractor shall cause environmental commitments made during the Environmental Approval and permitting processes, and other environmental requirements to be carried forward and reflected, as appropriate, in the design and implemented throughout the Work. DB Contractor shall utilize the CEPP to track on-going issues, identify environmental compliances, non-compliances, and identify actions required/taken to correct any such non-compliances.

At a minimum, the CEPP shall include the following component parts:

a. Environmental Management System (EMS);

b. Environmental Compliance and Mitigation Plan (ECMP);

c. Environmental Protection Training Program (EPTP);

d. Hazardous Materials Management Plan (HMMP);

e. Communication Plan (CP);

f. Construction Monitoring Plan (CMP); and

g. Environmental team resumes.

The dates by which component parts comprising the CEPP are to be submitted for TxDOT approval are set forth throughout these Technical Provisions. Amendments and updates to the CEPP as necessary to address changing conditions and environmental requirements shall be in accordance with the procedures set forth in the amendments to the PMP.

4.3.1 Environmental Management System

The EMS shall be the overarching plan by which DB Contractor shall cause environmental commitments made during the Environmental Approval and permitting processes, and other environmental requirements to be carried forward and reflected, as appropriate, in the design and implemented throughout the Work. DB Contractor shall utilize the EMS to track on-going issues, identify environmental compliances, non-compliances and identify actions required/taken to correct any such non-compliance.

The EMS shall establish a schedule for periodic CEPP review to ensure it is up to date. The EMS shall provide a means to track the reviews and results. At a minimum, the EMS shall require documents in the following list to be on file at the Site and available at any time for TxDOT review:

a. CEPP component parts;

b. Weekly Environmental Monitoring Reports;

c. Investigative Work Plans, site investigation reports, and remedial action plans as necessary for hazardous material discovery/remediation;

d. Wetland delineations reports and appropriate Section 404 authorized permit application(s);

e. Mitigation or resource monitoring reports, as required by resource-specific mitigation plans;

f. Designs for wetland, stream and floodplain mitigation;

g. Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit (TXR150000), Notice of Intent;

h. TPDES Construction General Permit (TXR150000), Notice of Termination for Work completed;

i. Storm Water Pollution Prevention Plan (SW3P) and amendments, as required to reflect Project development and staging, including off-site plans, controls and reporting from borrow sites, waste sites, and plant location sites;

j. Completed permit applications and permits as issued;

k. Pre-construction inspection report;

l. Training documentation;

m. DB Contractor's final noise analysis, if different than that included in the TxDOT-Provided Approvals;

n. Environmental Permits, Issues, and Commitments (EPIC) Sheets;

o. Construction Stage Gate Checklist (Form 2448);

p. Construction SW3P Field Inspection and Maintenance Report (Form 2118); and

q. Temporary Erosion, Sedimentation, and Environmental Controls (Special Specification 1122).

4.3.2 Environmental Compliance and Mitigation Plan

The ECMP shall document and fully detail compliance strategies and procedures to be employed to cause Work performance in accordance with requirements of applicable Environmental Laws and Environmental Approvals. This plan shall establish and/or document schedules, protocols, and methodologies to be used in accomplishing Work, with an emphasis on monitoring, reporting, corrective actions and adaptive management. The plan shall include a Compliance Action Plan (CAP). The CAP shall consist of a decision making matrix, which will define the triggers for initiating or re-initiating environmental compliance actions for construction and maintenance activities including construction noise mitigation measures and the triggers for initiating mitigation measures. For each trigger, the CAP shall identify the appropriate type or level of environmental study or other compliance action necessary to ensure the ongoing validity of Project Environmental Approvals and commitments. In addition, the ECMP shall detail any mitigation required by Environmental Approvals and DB Contractor's approach to satisfying mitigation requirements, including mitigation requirements identified after completion of the ECMP.

The ECMP shall include the following components:

- **Environmental Permits, Issues, and Commitments Sheets**

DB Contractor shall develop and maintain EPIC construction plan sheets. Applicable permits and environmental commitments shall be identified on EPIC sheets and updated throughout the construction period to identify on-Site conditions.

- **Clean Water Act - Sections 404 and 401: Waters and Wetlands of the United States**

TxDOT-Provided Approvals identify Section 404 impacts associated with Ultimate Project improvements. DB Contractor shall identify the extent of Section 404 impacts associated with the Project and procure the necessary Section 404 permits and Section 401 certifications from the U.S. Army Corps of Engineers (USACE) and Texas Commission on Environmental Quality (TCEQ). DB Contractor shall determine Project mitigation requirements, prepare necessary permit application(s), prepare a mitigation plan per 33 CFR Part 332, and deliver all required mitigation. DB Contractor shall be responsible for the maintenance and monitoring of any permittee-responsible mitigation sites for the term stipulated within the USACE approved mitigation plan. Project mitigation options shall be provided in accordance with

the TxDOT Memorandum dated June 17, 2013 regarding TxDOT's mitigation procurement policy. This document is located in the RID. All coordination with the USACE regarding Section 404 permitting and mitigation shall be disclosed to TxDOT for review and comment.

DB Contractor shall document how they will identify Section 404 impacts, obtain required Section 404 permits, and comply with the terms and conditions of the Section 404 permits and 401 certifications issued to DB Contractor during the life of the Project. The documentation at a minimum shall include:

a. Process for training personnel to recognize Waters of the U.S. that fall under the jurisdiction of the USACE;

b. Process for identifying Section 404 impacts associated with the Project;

c. Process for obtaining required Section 404 permits;

d. Process for communicating the terms and conditions of all USACE 404 permits and TCEQ 401 certifications and other permits as necessary;

e. Procedures for carrying out any required mitigation; and

f. Procedures for incorporating additional properties outside the original NEPA approved Base Scope Schematic and any off-right-of-way Project Specific Locations (PSL) as required by all Section 404 permit(s) issued to either TxDOT or DB Contractor by the USACE.

DB Contractor shall comply with all general and regional conditions set forth by authorized Section 404 Nationwide Permits as described in TxDOT-Provided Approvals.

- **Clean Water Act - Sections 402: Texas Pollutant Discharge Elimination System**

DB Contractor shall document how it will comply with Section 402 of the Clean Water Act (CWA). The documentation shall provide that DB Contractor has day-to-day operational control over activities necessary to ensure compliance with the SW3P and has the sole responsibility for any potential non-compliance issues. The documentation shall also provide that DB Contractor is responsible for submitting a Notice of Intent (NOI) to TCEQ. The documentation at a minimum shall include:

a. Process for training personnel on the requirements and conditions of the Texas Construction General Permits for Storm Water Discharges from Construction Sites (CGP);

b. Procedures for incorporating Additional Properties outside the original NEPA approved Base Scope Schematic and any off-right-of-way PSL within one linear mile of the Project limits to comply with the CGP and the Project's SW3P;

c. Procedures for handling non-compliance issues; and

d. Escalation procedures for SW3P items.

- **State Listed Species and Unregulated Habitat**

DB Contractor shall document how it will address state listed species and unregulated habitat. The documentation shall be in agreement with all MOUs and MOAs TxDOT has with the Texas Parks and Wildlife Department (TPWD), including the requirement for coordination with TPWD to be conducted by TxDOT. The documentation at a minimum shall include:

a. Process for communicating any commitments regarding state listed species and unregulated habitat; and

b. Procedures for complying with any commitments addressed in the TxDOT-Provided Approval, the MOUs between TxDOT and TPWD and coordination agreements with USFWS.

State Listed Species- DB Contractor shall comply with all state laws and regulations as related to state listed threatened and endangered species. The TxDOT-Provided Approval identified potential habitat within the Project limits for the following state listed species: plains spotted skunk, western burrowing owl, fawnsfoot, little spectaclecase, Louisiana pigtoe, Texas fawnsfoot, Texas heelsplitter, Texas pigtoe, Wabash pigtoe, alligator snapping turtle, Texas garter snake, timber/canebrake rattlesnake, and Glen Rose yucca. Prior to construction, DB Contractor shall review the applicable and most current state threatened and endangered species list to determine if changes to the lists (including, but not limited to, addition of species, changes to species habitat range and species listing status) have occurred since authorization of the applicable Environmental Approvals. DB Contractor shall identify all state listed species that have the potential to exist within the Project limits and determine the extent of Project impacts to the listed species during final design. DB Contractor shall perform field surveys to determine the presence of all the state listed species considered to incur impacts by the Project. If it is determined that state listed species are present within the Project limits, and adverse impacts will occur, DB Contractor shall work with TxDOT to develop mitigation approaches. DB Contractor shall prepare any materials needed for coordination or consultation with regulatory agencies, at TxDOT's direction. TxDOT will conduct coordination or consultation with the applicable state agencies for the Project. DB Contractor shall be responsible for any mitigation requirements identified from regulatory agency coordination/consultation.

Based on the current scope of work for the Project, it is likely that mussel surveys will be required. DB Contractor shall follow the steps above to determine mussel presence within the Project limits, and the extent of Project impacts on the species. DB Contractor shall report all findings to TxDOT, and if necessary, shall develop mussel relocation plans and/or other best management practices to ensure the preservation of present mussel species, at TxDOT's direction. DB Contractor shall ensure that approved best management practices are maintained throughout the construction process.

Vegetation and Habitat- DB Contractor shall use minimization and avoidance mitigation practices to preserve vegetation communities within the Project to the greatest extent possible. The TxDOT-Provided Approval identified vegetation impacts and compensatory mitigation requirements for Ultimate Project improvements utilizing the 1998 TxDOT and TPWD Memorandum of Understanding. As of September 1, 2013, a new MOU between TxDOT and TPWD has been issued. DB Contractor shall utilize the September 1, 2013 MOU to reassess and document vegetation community impacts associated with the Project. DB Contractor shall reassess unavoidable impacts to all vegetation communities through a Tier I Site Assessment as described in Section 2.205 of the September 1, 2013 MOU. DB Contractor shall document and coordinate the results of these impact findings with TxDOT. TxDOT shall determine the need for further coordination/consultation with applicable agencies, and perform such coordination. Furthermore, TxDOT in consultation with TPWD shall determine the need for further assessment of impacts to vegetation communities associated with the Project. DB Contractor shall prepare the materials necessary to coordinate with applicable agencies, at TxDOT's direction. DB Contractor shall also be responsible for performing additional assessments as required through agency consultation. DB Contractor shall deliver all best management practices and/or mitigation identified during the coordination/consultation process.

- **Endangered Species Act and Fish, Wildlife Coordination Act, and Migratory Bird Treaty Act**

DB Contractor shall document how it shall comply with the Endangered Species Act (ESA), the Fish and Wildlife Coordination Act (FWCA) and the Migratory Bird Treaty Act (MBTA). The documentation shall reflect that coordination with U.S. Fish and Wildlife Service (USFWS) shall be conducted by TxDOT. The documentation at a minimum shall include:

a. Process for training personnel on the requirements of the ESA, FWCA, and MBTA;

b. Process for communicating any commitments regarding ESA, FWCA, and MBTA on the Project; and

c. Procedures for complying with any commitments including mitigation measures or activities.

Federally Listed Species- DB Contractor shall comply with all federal laws and regulations as related to federally listed threatened and endangered species. The TxDOT-Provided Approval identified potential habitat within the Project limits for the Texas fawnsfoot, a federally listed candidate species. Prior to construction, DB Contractor shall review the applicable and most current federal threatened and endangered species list to determine if changes to the lists (including, but not limited to, addition of species, changes to species habitat range and species listing status) have occurred since authorization of the applicable Environmental Approvals. DB Contractor shall identify all federally listed species with potential to exist within the Project limits and determine the extent of Project impacts to the listed species during final design. DB Contractor shall perform field surveys to determine the presence of all the federally listed species considered to incur impacts by the Project. If it is determined that federally listed species are present within the Project limits, and adverse impacts will occur, DB Contractor shall work with TxDOT to develop mitigation approaches. DB Contractor shall prepare any materials needed for coordination or consultation with regulatory agencies, at TxDOT's direction. TxDOT will conduct coordination or consultation with the applicable federal agencies for the Project. DB Contractor shall be responsible for any mitigation requirements identified from regulatory agency coordination/consultation.

In accordance with the MBTA, no vegetation or man-made structures containing active nests, eggs, or young shall be removed during construction. In the event migratory birds are encountered during construction, DB Contractor shall make every effort to avoid adverse impacts to protected migratory birds, active nests, and their young. DB Contractor shall remove all old migratory bird nests between October 1 and February 15 from any vegetation or structure where construction will occur. In addition, DB Contractor shall be prepared to prevent migratory birds from building nests within applicable structures between February 15 and October 1. All proposed prevention methods shall be approved by a TxDOT Fort Worth District Biologist prior to planned use.

- **Traffic Noise**

DB Contractor shall document how it will address traffic noise mitigation and how they will perform public involvement associated with noise mitigation (noise workshops). The documentation at a minimum shall include:

a. Process for carrying out noise workshops and noise mitigation measures as identified and discussed in the TxDOT-Provided Approval and Base Scope Schematic and any supplemental noise studies completed by DB Contractor; and

b. Process for carrying out noise mitigation measures determined throughout the life of the Project.

c. Process to handle changes that may occur to proposed permanent noise mitigation in the TxDOT-Provided Approval and Base Scope Schematic.

As of the effective date of this document, public involvement associated with proposed noise abatement measures (noise workshops) identified within the Environmental Approvals has not been performed. DB Contractor shall be responsible for public notification of affected property owners, the surveying/balloting of affected property owners, and final design of approved noise barriers. DB Contractor shall perform all noise workshops per TxDOT *Guidelines for Analysis and Abatement of Highway Traffic Noise* and in accordance with Section 3 (Public Information and Communications). DB Contractor shall allow fifteen (15) Days for adjacent affected property comments after each noise workshop. DB Contractor shall coordinate all results of noise workshops held with TxDOT.

To fulfill the commitments of the previously mentioned TxDOT-Provided approvals, DB Contractor shall be responsible for implementing all noise mitigation measures to minimize construction and long-term impacts of the Work as prescribed in TxDOT-Provided approvals and subsequent TxDOT-Provided Approvals secured by DB Contractor. DB Contractor acknowledges that TxDOT-Provided Approvals and proposed permanent noise mitigation are based on the Base Scope Schematic and Base Scope Schematic ROW; consequently the proposed permanent noise mitigation may require amending by DB Contractor as the Work progresses. Such amendments shall be submitted to TxDOT for review and approval.

DB Contractor shall be responsible for all coordination with adjacent property owners and Governmental Entities necessary to obtain all such amendments to TxDOT-Provided Approvals and for ensuring compliance with the conditions and schedules set forth in the amendment of any TxDOT-Provided Approvals.

- **Water Well Impacts and Requirements**

DB Contractor shall document how it will address wells (such as municipal, domestic, irrigation, oil and gas, or monitoring and observations wells) encountered during the life of the Project. The documentation shall include that DB Contractor is responsible for plugging and abandoning all wells in accordance with Item 103, Disposal of Wells, from TxDOT Standard Specifications, as well as DB Contractor is responsible for any required remediation efforts. The documentation at a minimum shall include:

a. Process for training personnel on recognition of wells;

b. Procedures for handling wells; and

c. Procedures for handling contamination of a well that results from DB Contractor's Work. Procedures shall include a requirement to notify TxDOT and with TxDOT's concurrence, notify appropriate regulatory agency within 24 hours of the discovery.

- **Cultural Resource Studies**

DB Contractor shall be responsible for ensuring compliance with cultural resource Laws on the Project through the Term of the DBA. TxDOT shall perform consultation for the Project according to current procedures for implementing Section 106 of the National Historic Preservation Act, and the Antiquities Code of Texas.

Subsequent to issuance of NTP1, DB Contractor shall be responsible for performing any necessary cultural resource surveys, evaluations, testing, and mitigation in those areas outside the footprint of the Project ROW shown on the Base Scope Schematic as defined in the TxDOT-Provided Approval and within the area of potential effects. DB Contractor shall coordinate all necessary Antiquities Permits through TxDOT. Antiquities Permits shall be obtained from the Texas Historical Commission (THC) for archeological surveys, testing, monitoring, and data recovery.

DB Contractor shall document efforts to avoid impacts to cultural resources that are listed on or determined to meet the eligibility criteria for listing to the National Register of Historic Places (NRHP) as specified in 36 CFR 60.4, or that are designated or determined to meet the criteria for designation as State Antiquities Landmarks as specified in 13 TAC 26.8.

If evidence of possible archeological or historical resources is encountered during the course of the Work, DB Contractor shall immediately cease Work in the immediate area and contact TxDOT to initiate post-review discovery procedures under the provisions of the Programmatic Agreement (PA) among TxDOT, SHPO, FHWA, and ACHP as well as the MOU between TxDOT and the THC. DB Contractor shall undertake appropriate measures to protect the site from further intrusion to the extent feasible until an

appropriate evaluation of the site can be made by a qualified representative. Work shall not be resumed in the area until DB Contractor receives notification and approval from TxDOT.

- **Public Involvement**

DB Contractor shall document how it will comply with all public involvement requirements, including public involvement requirements specifically related to cultural resources. The documentation shall comply with all applicable requirements including, but not limited to, 43 TAC §2.4, Section 106 of the National Historic Preservation Act (36 CFR 800), Chapter 26 of the Texas Parks and Wildlife Code, the Civil Rights Act of 1964, and the Civil Rights Restoration Act of 1987. The documentation shall provide that DB Contractor is responsible for conducting all public involvement requirements for the life of the Project except where TxDOT has agreements with Governmental Entities to perform public involvement requirements. The documentation at a minimum shall include:

a. Process for handling public involvements requirements; and

b. Procedures for documenting public involvement.

- **Standard Operating Procedures**

DB Contractor shall develop standard operating procedures for the following activities and include them in the ECMP:

a) Controlling dust during construction;

b) Mitigating vibration during construction;

c) Mitigating light intrusion on adjacent properties;

d) Performing noise workshops;

e) Identifying protected species habitat, and providing species surveys;

f) Identifying impacts to special and unique vegetation habitats, and providing mitigation for such impacts; and

g) Identifying Section 404 impacts and complying with issued Section 404 permits for the Project.

4.3.3 Environmental Protection Training Program

DB Contractor shall develop and implement an Environmental Protection Training Program (EPTP) that shall meet the minimum requirements set forth herein. The EPTP shall include methods and procedures documented in the ECMP to:

a. Educate every worker to:

- Recognize the overall importance of environmental issues to constructing, operating and maintaining a successful Project;
- Recognition of State or Federally-Listed Species that could occur in the Project area; and
- Appreciate the various environmental sensitivities of the Project.

b. Train every worker to:

- Recognize environmentally sensitive resources that may be encountered during the Work;
- Avoid or take appropriate action to minimize environmental impacts from the Work;
- Know the required actions, practices, and procedures regarding regulated resources; and

- Understand protocols for meeting environmental commitments for post-review discoveries.

c. Foster DB Contractor's management and supervisory personnel's attitude of commitment to the Project's environmental quality.

d. Convey to all workers, DB Contractor's management commitment to the Project's environmental quality.

e. Convey to all workers, TxDOT's and DB Contractor's commitment to zero tolerance for violations.

4.3.3.1 EPTP Scope and Content

The goal of the EPTP is to educate Project personnel about the following:

a. Overall importance of environmental protection to the Project;

b. Compliance responsibility and Governmental Entity authority including background and environmental issues regulatory overview;

c. Overview of DB Contractor's environmental commitments and responsibilities at the Project level;

d. Worker responsibilities;

e. Wetlands and jurisdictional waters of the U.S. identification;

f. Environmental Approvals terms and conditions including an overview of the provisions of the ESA, Migratory Bird Treaty Act, and SW3P;

g. Best Management Practices (BMP)s for environmental compliance, including pollution prevention, erosion, sedimentation, post construction controls, and dust control measures to maintain water and air quality;

h. Required mitigation measures for ESA/FWCA compliance;

i. Procedures and precautions in the event of spills of or discovery of Hazardous Materials or unknown chemicals or contamination;

j. Procedures and precautions in the event human skeletal remains or other archeological or paleontological resources are discovered;

k. Procedures regarding the relocation of historical markers (i.e. Texas Historic Commission Subject Markers, Texas Centennial Markers, TxDOT Markers, and local/county markers);

l. Groundwater protection requirements.

m. CWA regulations and surface water protection requirements;

n. Overview of noise and residential impact reduction procedures;

o. Air quality requirements; and

p. Penalties and/or fines for violations of and noncompliance with Environmental Approvals and Environmental Laws, including termination of employment.

DB Contractor shall submit to TxDOT for review and approval course outlines containing learning objectives designed to achieve stated goals and suggested staff attendance for all anticipated training requirements through the Term of the DBA. Course outlines shall be submitted within ninety (90) Days after NTP1.

4.3.4 EPTP Participation

DB Contractor shall require all non-administrative employees to participate in the EPTP and shall keep accurate records documenting attendance, as well as materials presented.

4.3.4.1 EPTP Schedule

DB Contractor shall include activities for implementation of the EPTP in the Project Schedule. The length of training sessions and their frequency shall be sufficient to achieve the goals set forth above. Periodic training sessions at key times (e.g., prior to construction or major maintenance in sensitive areas or construction timing restrictions to protect threatened and/or endangered species) shall be used to update workers on specific restrictions, conditions, concerns, and/or requirements.

4.3.5 Hazardous Materials Management Plan

DB Contractor shall prepare an HMMP for the safe handling, storage, treatment and/or disposal of Hazardous Materials, whether encountered at or brought onto the Project Site by DB Contractor, encountered or brought onto the Project site by a third party, or otherwise, during the Term of the DBA. DB Contractor shall submit the final HMMP to TxDOT for review and approval in its good faith discretion within sixty (60) Days of NTP1; approval of the Plan by TxDOT shall be a condition of commencement of Construction Work.

The HMMP shall include procedures compliant with all applicable Environmental Laws and include, at a minimum:

a. For all chemicals to be used on the Project, DB Contractor shall keep and update Material Safety Data Sheets (MSDS), per OSHA requirements, for the Term of the DBA;
b. Designated individuals responsible for implementation of the plan;
c. Procedures for identifying and documenting potential contaminated sites which might impact Project development;
d. Procedures for mitigation of known contaminated sites anticipated to impact construction;
e. Procedures for mitigation of unanticipated contaminated sites encountered during construction;
f. Procedures for mitigation of contamination during the operation and maintenance of the Project;
g. Procedures for developing a detailed spill response plan for the Term of the Project;
h. Process for training personnel for responding to and mitigating Incidents involving contamination or waste;
i. Provisions for appropriate storage and disposal of all waste encountered or disposed of on the Project for the Term;
j. Provision for a Hazardous Materials training module as an element of the EPTP component of the CEPP;
k. Procedures for preparing an Investigative Work Plan (IWP) and Site Investigative Report (SIR) in the event that Hazardous Materials are discovered during construction; operations or maintenance activities;
l. Identification and contact information for designated responsible individuals; and
m. Procedure for notifying TxDOT within two (2) hours of discovering Hazardous Materials.

The HMMP shall include provisions for making all on-site workers aware of and able to recognize the potential Hazardous Materials to which they may be exposed, limiting Subcontractors and other Site workers' exposure to Hazardous Materials and providing all necessary personal protection equipment to

protect workers from exposure. The HMMP shall require DB Contractor to provide any non-DB Subcontractor personnel who visit the Project with the appropriate personal protection equipment.

The HMMP shall require that all personnel of DB Contractor-Related Entities handling Hazardous Materials be trained and certified at least to the minimum requirements established under the current guidelines of OSHA 1910.120 (HAZWOPER Training).

Further, the HMMP shall include procedures for ensuring that all applicable certifications, licenses, authorizations and Governmental Approvals for DB Contractor personnel handling Hazardous Materials are current and valid through the duration of the Work.

4.3.5.1 Investigative Work Plans (IWP) and Site Investigation Reports (SIR)

If Hazardous Materials are encountered within any of the Project ROW or Additional Properties used as DB Contractor's staging area, Project office site, plant sites, borrow site, or stockpile location, DB Contractor shall prepare an investigation work plan that addresses the methods, techniques, and analytical testing requirements to adequately characterize the extent of the contaminated media (soil and/or groundwater) potentially impacting the Project. DB Contractor shall locate and assess the likely source of contamination.

A Registered Professional Engineer and other qualified professionals, as needed, shall prepare the IWP and other necessary reports in accordance with applicable, relevant or appropriate Laws and guidance.

Upon satisfactorily completing the investigative work, DB Contractor shall summarize the findings within a Site Investigation Report and make recommendations regarding potential response actions necessary for Project development. DB Contractor shall take Hazardous Materials contamination into account during all subsequent phases of Project development, including Additional Properties negotiation and acquisition, property management, design, and construction.

The Site Investigation Report shall address the characterization of the impacted area; sampling efforts and findings; opportunities to avoid the contamination by adjusting the design; level of response action warranted if the contamination cannot be avoided; feasibility of initiating response actions prior to construction; pursuit of cost-reimbursement from responsible parties; the need for completing response actions concurrent with construction and nature of any special specifications and provisions necessary for incorporation into the Project.

DB Contractor may initiate a preventative or corrective action after TxDOT review and approval of the Site Investigation Report from appropriate Federal or State agencies.

4.3.6 Communication Plan (CP)

DB Contractor shall develop a CP, which describes in detail the communication hierarchy for information distribution related to the compliance with the CEPP. The CP will include names and contact information, including emergency contact information, and the preferred methods of routine, and emergency communication distribution.

4.3.7 Construction Monitoring Plan (CMP)

The CMP shall identify times, locations, and other conditions where monitoring of construction activities are to be performed to maintain and cause compliance with Environmental Laws, Environmental Approvals, and the DBA Documents. The CMP shall establish and/or document schedules, protocols and methodologies to be used for monitoring Work with an emphasis on timely reporting, corrective actions and adaptive management. The CMP shall establish reporting procedures, identify reporting requirements and establish controls for report distribution and records retention. All Environmental Monitoring Reports shall be made available for review by TxDOT at TxDOT's request. Should any non-compliance

or violation be observed that represents an imminent danger to human health or the environment, the CMP shall include procedures to cause immediate notification of TxDOT.

Prior to NTP2, DB Contractor and TxDOT shall jointly inspect existing facilities, structures, and environmentally sensitive areas in the vicinity of the Site but not included as part of the Work. DB Contractor shall provide a minimum two (2)-week advance notice to TxDOT of this joint inspection. The post award inspection shall document the pre-construction condition of vegetation, streets, sidewalks, landscaping, residential and commercial property, creeks, storm drainage and infrastructure. The purpose of the inspection is to provide a point of reference from which TxDOT can determine if any facility, structure and environmentally sensitive area damaged during the Work is restored to its pre-construction condition or mitigated according to the ECMP. DB Contractor shall document the inspection with a report that shall include photographs, sketches, maps, and narratives clearly depicting the pre-construction Site condition.

All photographs shall be archival quality and shall be accompanied by a caption describing the date; time of day; location and direction in which the photograph was taken. If the photograph shows existing damage, the damage must be clearly shown and noted in the caption. All sketches and maps must be no larger than 11 inches x 17 inches. All photographs must be 4 inches x 6 inches.

The post award inspection shall inspect the municipal separate storm sewer system located within and adjacent to the Site. During the inspection, DB Contractor shall note the following:

a. Storm drains, culverts, swales, and other components of the municipal separate storm sewer system that DB Contractor verified as free of floatable trash, silt, debris, and functioning as originally intended;

b. Storm drains or culverts that do not function or appear not to function as originally intended;

c. Siltation of culverts, concrete swales, and other components of the municipal separate storm sewer system;

d. The presence of construction on adjacent, up-gradient, or down-gradient properties. If construction on other properties is noted, DB Contractor shall photographically document the general condition of these properties and their compliance with storm water regulations;

e. Pre-existing off-site tracking from the Site or surrounding properties;

f. Potential pre-existing contamination (i.e., any areas of soil discoloration or distressed vegetation); and

g. Any other pre-existing condition that, by its nature, could be construed as a violation of the TPDES General Construction Permit.

Following construction of the Project, DB Contractor shall conduct a yearly inspection to monitor and repair any of the above mentioned deficiencies in the storm water system for the duration of the Warranty.

4.3.8 Recycling Plan

The recycling plan shall document and fully detail DB Contractor's commitment to recycling, waste minimization and use of "green products" during all aspects of Work. The recycling plan shall document DB Contractor's recycling initiatives as well as methods and procedures for maximizing the use of recycled materials in all aspects of the Work. If recyclable materials shall be used in lieu of TxDOT approved construction and maintenance materials, DB Contractor shall follow the TxDOT Material Specification DMS 11000. The recycling plan shall be submitted as part of the CEPP in accordance with the requirements set forth in this Section 4.3.8.

4.4 Environmental Personnel

DB Contractor, acting through the Environmental Compliance Manager (ECM), shall designate an Environmental Team (ET), as detailed in this section, to prevent, minimize, and/or correct any violation or noncompliance with Environmental Approvals. The ET shall include, on an as-needed basis, Environmental Training Staff, Environmental Compliance Inspectors (ECIs), a Natural Resource Biologist, a Water Quality Specialist, and a Hazardous Materials Manager. All of the ET shall be deemed other principal personnel. If a cultural background study reveals a high probability of encountering cultural resources, the ET shall also include an archeologist, architectural historian, historian or historical architect on an as-needed basis.

In the CEPP, DB Contractor shall establish a detailed approach, procedures and methods for:

a. Staffing and availability of ECM and all ET personnel; and

b. ET staff response times during the Work.

4.4.1 Environmental Compliance Manager

DB Contractor shall designate a full-time ECM for the Work. The ECM shall report and coordinate all issues directly with TxDOT and DB Contractor's Project Manager. In the event the ECM, in consultation with DB Contractor's Project Manager and TxDOT, is unable to reach satisfactory resolution of environmental issues, the ECM shall provide written notification to DB Contractor and TxDOT outlining the concerns, actions taken in attempt to correct the concerns, and provide a recommendation as to the suggested course of action.

The ECM shall direct the work of the ET and shall monitor, document, and report the current status of environmental compliance for the Work. The ECM shall report immediately to TxDOT and DB Contractor any violation or non-compliance and shall include with any such report, the appropriate recommendations for corrective action including stoppage of Work.

The ECM shall coordinate with TxDOT, DB Contractor, and appropriate Governmental Entities. The ECM shall submit all necessary environmental documentation and monitoring reports to the appropriate Governmental Entities and when applicable, through TxDOT, to the extent necessary to maintain compliance with applicable Environmental Approvals.

DB Contractor shall not have the ability to relieve the ECM of his or her duty without the written consent of TxDOT. Should DB Contractor desire to replace ECM, DB Contractor shall submit to TxDOT the resume of a replacement candidate. The replacement candidate shall be available fulltime within thirty (30) Days after delivery of TxDOT's written acceptance. In the absence of the Environmental Compliance Manager, DB Contractor's Hazardous Materials Manager shall act as an interim Environmental Compliance Manager.

4.4.2 Environmental Training Staff

Under the direction of the ECM, the environmental training staff shall develop, schedule and conduct environmental awareness and environmental compliance training for DB Contractor's personnel. All training shall be in accordance with the requirements set forth in Section 4.2.3 (TxDOT Review and Approval of DB Contractor Submissions). Environmental Training Staff members shall have at least one (1) year of experience providing environmental compliance inspection for freeway construction.

4.4.3 Environmental Compliance Inspectors (ECI)

The ECM shall designate as needed ECIs, who shall conduct on-site environmental monitoring, prepare documentation, and report to the ECM daily all violations, compliance, and non-compliance with Environmental Approvals.

The ECIs shall report immediately to the ECM any violation or non-compliance and shall include with any such reports, the appropriate recommendations for corrective action, including, but not limited to stoppage of Work.

The ECIs shall have at least one (1) year operational control experience of SW3P activities.

4.4.4 Hazardous Materials Manager

The ECM shall designate as needed a Hazardous Materials Manager to provide expertise in the safe handling of Hazardous Materials required to perform the Work and those that may be discovered/impacted during the duration of the DBA Document. The Hazardous Materials Manager shall conduct appropriate activities such as the following:

a. Schedule and/or conduct training for DB Contractor's employees;

b. Verify all employees have required certifications prior to the handling of Hazardous Materials; and

c. Maintain records of all incidents involving Hazardous Materials and notify the ECM, TxDOT and appropriate authorities in writing of any such incidents.

The Hazardous Materials Manager shall be a qualified professional with forty (40) hour HAZWOPER certification and at least five years of experience in similar projects in the following areas:

a. Experienced in developing IWPs, SIRs, and remedial action plans or equivalent reports necessary and acceptable to the TCEQ in material discovery and remediation efforts of Hazardous Materials; and

b. Experienced in TCEQ guidance for the investigation and remediation of Hazardous Materials under the TCEQ Voluntary Cleanup Program and Texas Risk Reduction Program Rules.

The Hazardous Materials Manager shall meet the certification requirements of TxDOT Work Category 2.13.1, “Hazardous Materials Initial Site Assessment.”

4.5 Property Access

To fulfill the obligation of the TxDOT-Provided Approvals to maintain current access during and after construction, DB Contractor shall make reasonable efforts to minimize the inconvenience to vehicles, bicycles and pedestrians during the Term of DBA. DB Contractor shall maintain access to adjacent properties during construction and ensure that visibility of businesses is maintained.

4.6 Dust Control

DB Contractor shall institute dust control measures to minimize air quality impacts. The measures shall be adjusted as necessary based on construction traffic, forecasted wind speeds, and persistent dry weather conditions.

4.7 Asbestos Containing Material (ACM)

DB Contractor shall identify, inspect, notify, amend notifications as necessary, pay notification fees and abate asbestos found on any existing structure to be modified by DB Contractor, including but not limited to, bridges and buildings, in accordance with appropriate or relevant regulations or guidance.

DB Contractor shall notify the Texas Department of State Health Services if asbestos is found during construction.

5 THIRD PARTY AGREEMENTS

5.1 General Requirements

TxDOT has existing agreements with local Governmental Entities along the Project corridor that define the requirements for construction, maintenance, and operation of traffic signals, illumination, bus facilities, tolling, and roadway maintenance. These agreements specify the local Governmental Entities responsibilities and TxDOT's responsibilities with respect to the requirements and are provided in the Reference Information Documents.

For the purpose of the DBA Documents, DB Contractor shall assume and execute TxDOT's responsibilities and duties as defined in the current and future agreements. DB Contractor is responsible for providing TxDOT and Governmental Entities with all information necessary for it to fulfill TxDOT's responsibilities under these agreements.

In accordance with current and subsequent agreements requiring TxDOT to reimburse the local Governmental Entity for their role in operating and/or maintaining certain facilities, DB Contractor shall reimburse TxDOT the said costs. DB Contractor shall make payment to TxDOT within thirty (30) days from receipt of TxDOT's request for payment.

5.2 Traffic Signals

New construction or modifications to the existing traffic signals are defined in Section 16 (Signing, Delineation, Pavement Marking, Signalization, and Lighting).

DB Contractor shall assume and execute TxDOT's responsibilities and duties as defined in Attachment 5-1 (Municipal Maintenance Agreement Operation and Maintenance of Traffic Signals) into operation of the permanent signal system.

5.2.1 Red Light Cameras

Not applicable.

5.3 Roadway Illumination

Some local Governmental Entities may request continuous illumination along the frontage roads within the Project limits. Should this occur, additional agreements between TxDOT and the Governmental Entity will be required. DB Contractor shall coordinate with and provide reasonable accommodations to the third party to carry out the installation, operations and maintenance obligations as specified in such agreements.

For sections of continuous lighting specified by these additional agreements, safety lighting included in that section is considered a component of the overall system and responsibilities for said safety lighting shall be those in the terms of the additional agreement.

New construction or modifications to the existing illumination are defined in Section 16 (Signing, Delineation, Pavement Marking, Signalization, and Lighting).

DB Contractor shall assume and execute TxDOT's responsibilities and duties as defined in Attachment 5-2 (Municipal Maintenance Agreements for Highway Lighting).

5.4 Utility Agreements

DB Contractor shall assume and execute TxDOT's responsibilities and duties as defined in Attachment 5-3 (Utility Joint Use Agreements). With respect to the Utility Owner's facilities referenced in the Joint Use Agreements contained in Attachment 5-3, DB Contractor shall submit design plans for excavation within fifteen (15) feet of the facilities for Utility Owner's review and approval.

5.5 Other Affected Third Parties

When Work interfaces with other third party facilities, DB Contractor is responsible for coordinating the Work with all third parties potentially affected by the Work. DB Contractor shall prepare a plan, the Affected Third Parties Plan, which describes how DB Contractor will mitigate the impact of the Work upon potentially impacted third parties. This plan shall require TxDOT's review prior to initiating discussions with potentially impacted third parties.

6 UTILITY ADJUSTMENTS

6.1 General Requirements

A number of existing Utilities are located within or in the vicinity of the Project ROW, some pursuant to statutory rights and some pursuant to property rights. Certain of those existing Utilities will need to be relocated or otherwise adjusted in order to accommodate the Project. This Section 6 establishes procedures and requirements for Utility Adjustments including such processes as coordination with Utility Owners, administration of the engineering, construction and other activities necessary for Utility Adjustments, and required documentation. This Section 6 references certain TxDOT forms for DB Contractor's use in Utility Adjustments. Copies of those forms are included in Attachment 6-1. Except as otherwise provided in this Section 6 or directed by TxDOT, whenever a TxDOT form is provided, DB Contractor shall prepare all forms of the same type using the TxDOT form and is required to notify TxDOT of all changes to the forms for TxDOT's approval prior to execution by the Utility Owner.

DB Contractor shall cause all Utility Adjustments necessary to accommodate construction, operation, maintenance and/or use of the Project. Some Utility Adjustments may be performed by the Utility Owner with its own employees and/or contractors and consultants (i.e., Owner-Managed); all others shall be performed by DB Contractor with its own employees and/or Subcontractors and consultants (subject to any approval rights required by the Utility Owner for those working on its facilities) (i.e., DB Contractor-Managed). The Utility Agreement shall specify the allocation of responsibility for the Utility Adjustment Work between DB Contractor and the Utility Owners as described in Section 6.1.3.

The Project will be subject to 23 CFR Part 645 Subpart A and 23 CFR Section 635.410 (Buy America), and FHWA's associated policies. DB Contractor shall comply (and shall require the Utility Owners to comply) with 23 CFR Part 645 Subpart A and 23 CFR Section 635.410. DB Contractor acknowledges that without regard to whether such compliance is required, (a) it is not anticipated that DB Contractor will be eligible for FHWA reimbursement of any Utility Adjustment outlays, and (b) DB Contractor will not have any share in any reimbursement from FHWA or other federal financing or funding that TxDOT may receive on account of Utility Adjustments.

DB Contractor's obligations regarding reimbursement to Utility Owners for eligible costs of Utility Adjustment Work, and DB Contractor's obligations regarding the accommodation of Utilities from and after NTP2, are set forth in Section 6.8.1 of the Agreement.

This Section 6 does not address Utility services to the Project. Utility services to the Project shall be the subject of separate agreements between DB Contractor and Utility Owners.

6.1.1 When Utility Adjustment is Required

A Utility Adjustment may be necessary to accommodate the Project for either or both of the following reasons: (a) a physical conflict between the Project and the Utility, and/or (b) an incompatibility between the Project and the Utility based on the requirements in Section 6.2.1 (Standards), even though there may be no physical conflict. The physical limits of all Utility Adjustments shall extend as necessary to functionally replace the existing Utility, whether inside or outside of the Project ROW. Section 6.2.4.2 (Acquisition of Replacement Utility Property Interests) contains provisions that address the acquisition of Replacement Utility Property Interests for Utilities to be installed outside of the Project ROW.

Utilities may remain in their existing locations within the Project ROW if (a) the requirements of Section 6.2.1 (Standards) are met, and (b) the existing location will not adversely affect the construction, operation, safety, maintenance and/or use of the Project and Utility. The Utility Owner must agree to its facilities remaining in its existing location.

Existing Utilities located on an Existing Utility Property Interest that cross the mainlane centerline at less than 90 degrees may remain in the existing alignment, as long as the Utility crosses at no less than a 30 degree angle to the mainlane centerline and does not cross diagonally through connecting intersections. An existing Utility may remain or be relocated in place in these areas only if all conditions of the Utility Accommodation Rules (UAR) are met, other than the 90 degree reference in the UAR. DB Contractor is responsible for applying for and assisting TxDOT in obtaining any exceptions to the UAR.

The Oncor electric transmission lines crossing just north of East Sublett Road (Sta. 748+00), at New York Ave. (Sta. 817+75) and at Holland Ave. (Sta. 1005+50) are intended to remain in their current horizontal alignment due to the Existing Utility Property Interest. However, DB Contractor must assess and determine the appropriate risk associated with each potential Utility Adjustment for each of the transmission crossings after discussion with Oncor.

The existing 72" and 90" waterlines located in Tarrant County Regional Water District (TRWD) Existing Utility Property Interest, located just south of Lone Star Road (Sta. 1142+50), are also intended to remain in their current alignment. DB Contractor is required to coordinate with TRWD to determine the specific requirements for the mainline crossings of the TRWD Existing Utility Property Interest. The frontage roads will be required to meet the TRWD design requirements in Section 1.2.1.10 of the Technical Provisions within the TRWD Existing Utility Property Interest.

TxDOT has determined that both the Oncor Existing Utility Property Interest for the three transmission crossings (with Oncor retaining an easement for electrical purposes) and a permanent easement for highway purposes for the TRWD crossing, referenced above, will need to be acquired for construction of the Project. In the event acquisition of these Oncor and TRWD interests has not occurred prior to issuance of NTP1, DB Contractor shall be responsible for completing the acquisition of such interests in accordance with the requirements of the DBA Documents, upon issuance of NTP1.

6.1.2 Certain Components of the Utility Adjustment Work

6.1.2.1 Coordination

DB Contractor shall communicate, cooperate, and coordinate with TxDOT, the Utility Owners and potentially affected third parties, as necessary for performance of the Utility Adjustment Work. DB Contractor shall be responsible for preparing and securing execution (by DB Contractor and the Utility Owner) of all necessary Utility Agreements.

All Utility Agreements must be approved by TxDOT prior to beginning any Utility Adjustment construction activity.

6.1.2.2 Betterments

Replacements for existing Utilities shall be designed and constructed to provide service at least equal to that offered by the existing Utilities, unless the Utility Owner specifies a lesser replacement. Utility Enhancements are not included in the Work; however, any Betterment work furnished or performed by DB Contractor as part of a Utility Adjustment shall be deemed added to the Work, on the date the Utility Agreement becomes effective as set forth in Section 6.8.2 of the Agreement. DB Contractor shall perform all coordination necessary for Betterments.

6.1.2.3 Protection in Place

DB Contractor shall be responsible for Protection in Place of all Utilities impacted by the Project as necessary for their continued safe operation and structural integrity and to otherwise satisfy the requirements described in Section 6.2.1 (Standards). The Utility Owner must agree to all Protection in Place work that pertains to Utility Owner's facilities.

6.1.2.4 Abandonment and Removal

DB Contractor shall make all arrangements and perform all work necessary to complete each abandonment or removal (and disposal) of a Utility in accordance with the requirements listed in Section 6.2.1 of the Technical Provisions, including obtaining Governmental Approvals and consent from the affected Utility Owner and any affected landowner(s), or shall confirm that the Utility Owner has completed these tasks.

Utility facilities that will be abandoned in place must be clearly identified in the Utility Assembly plans. The Utility plans must detail the method of abandonment to be utilized for TxDOT to determine if UAR requirements are met. The plans must also detail the age, condition, material type, active status and size. Additionally, the plans must state that the Utility Owner continues to own/maintain the abandoned Utility, keep records of its location and the Utility Owner certifies that the facility doesn't contain nor is composed of hazardous/contaminated materials. Significant voids or abandoned pipe beneath the right of way are prohibited. All voids must be filled with cement slurry or backfilled per TxDOT specifications. Any pipe to be abandoned in place must be grout filled and/or capped in accordance with jurisdictional requirements or as directed by TxDOT.

6.1.2.5 Service Lines and Utility Appurtenances

Whenever required to accommodate construction, operation, maintenance and/or use of the Project, DB Contractor shall cause Service Line adjustments and Utility Appurtenance Adjustments. Each Service Line shall have a definitive point of termination such as a meter or point of sale. On completion of these, DB Contractor shall cause full reinstatement of the roadway, including reconstruction of curb, gutter, sidewalks, driveways and landscaping, whether the Utility Adjustment Work is performed by the Utility Owner or by DB Contractor.

6.1.2.6 Early Adjustments

Not applicable.

6.1.3 Agreements Between DB Contractor and Utility Owners

Except as otherwise stated in this Section 6 or in the Agreement, each Utility Adjustment shall be specifically addressed in a Project Utility Adjustment Agreement (PUAA) or in a Utility Adjustment Agreement Amendment (UAAA), as described elsewhere in this Section 6. DB Contractor is responsible for preparing, negotiating (to the extent allowed by this Section 6), and obtaining execution by the Utility Owners, of all Utility Agreements, (including preparing all necessary exhibits and information about the Project, such as reports, Plans and surveys). A Utility Agreement is not required for any Utility work consisting solely of Protection in Place in the Utility's original location within the Project ROW, unless the Utility Owner is being reimbursed for costs incurred by it on account of such Protection in Place. If no reimbursement is required to the Utility Owner, a Utility Joint Use Acknowledgement or Utility Installation Request, Form 1082, as required in Section 6.2.4.5 of the Technical Provisions and set of plans detailing UAR compliance is required pertaining to the adjustment or Protection in Place work. However, if a Utility owner requests that the DB Contractor relocate a Utility, and the cost of that Utility Adjustment is the Utility Owner's sole responsibility in accordance with Transportation Code 203.092, then the DB Contractor shall enter into a DB Contractor-Managed PUAA with the Utility Owner providing for the Utility Owner to be responsible for all costs of that Utility Adjustment Work.

6.1.3.1 Project Utility Adjustment Agreements (PUAA)

DB Contractor shall enter into one (1) or more PUAAs with each affected Utility Owner to define the design, material, construction, inspection, and acceptance standards and procedures necessary to complete Utility Adjustments, as well as to define DB Contractor's and the Utility Owner's respective responsibilities for Utility Adjustment costs and Utility Adjustment activities such as material procurement, construction, inspection, and acceptance. A PUAA may address more than one (1) Utility

Adjustment for the same Utility Owner. Additional Utility Adjustments may be added to an existing PUAA by a Utility Adjustment Agreement Amendment (UAAA).

DB Contractor shall prepare each PUAA using the standard form of TxDOT Project Utility Adjustment Agreement (Owner-Managed) or TxDOT Project Utility Adjustment Agreement (DB Contractor-Managed), included in Attachment 6-1. DB Contractor shall not modify the standard forms except by approval of TxDOT.

Promptly following issuance of NTP1, DB Contractor shall begin negotiations with each affected Utility Owner to reach agreement on one (1) or more PUAAs. DB Contractor shall finalize the necessary PUAAs with each affected Utility Owner within a reasonable time period after issuance of NTP1. DB Contractor shall include any proposed changes to a standard form (other than filling in blanks specific to a particular Utility Owner) in a Utility Owner-specific addendum. Each PUAA (including the Utility Adjustment Plans attached thereto) shall be subject to TxDOT review and approval as part of a Utility Assembly.

DB Contractor shall obtain approval by TxDOT of any language modification to a PUAA by the Utility Owner and DB Contractor prior to the submission of a Utility Assembly.

6.1.3.2 Utility Adjustment Agreement Amendments

Except where Utility Adjustment Field Modifications are permitted pursuant to Section 6.4.7 (Utility Adjustment Field Modifications), modification of an executed PUAA or any component thereof, after it has been approved by TxDOT as part of a Utility Assembly, shall be stated in a Utility Adjustment Agreement Amendment (UAAA). A UAAA may be used only when the allocation of responsibility for the Utility Adjustment Work covered by that UAAA is the same as in the underlying Utility Agreement; otherwise, an additional PUAA will be required.

Each UAAA (including any Utility Adjustment Plans attached thereto) shall be subject to TxDOT's approval as part of a Supplemental Utility Assembly. Except as otherwise directed by TxDOT or provided in an applicable Utility Agreement, DB Contractor shall prepare all UAAAs using the form included in Attachment 6-1. DB Contractor shall not modify the forms except by approval of TxDOT. DB Contractor shall include any proposed changes to a form (other than filling in the blanks specific to a particular Utility Owner) in a Utility Owner specific addendum.

Language modification to a UAAA must be approved by TxDOT prior to the submission of the UAAA.

6.1.4 Recordkeeping

DB Contractor shall maintain construction and inspection records in order to ascertain that Utility Adjustment Work is accomplished in accordance with the terms and in the manner proposed on the approved Utility Adjustment Plans and otherwise as required by the DBA Documents and the applicable Utility Agreement(s).

6.2 Administrative Requirements

6.2.1 Standards

All Utility Adjustment Work shall comply with all applicable Laws, Codes, Regulations and Technical Provisions of the Agreement, including, but not limited to 43 TAC, Part 1, Chapter 21, Subchapter C, Utility Accommodation Rules (UAR), the TxDOT *ROW Utility Manual*, Section 6.8 of the Agreement, and the requirements specified in this Section 6.

6.2.2 Communications

6.2.2.1 Communication with Utility Owners

DB Contractor is responsible for holding meetings and otherwise communicating with each Utility Owner as necessary to timely accomplish the Utility Adjustments in compliance with the DBA Documents. DB Contractor must notify TxDOT of all meetings and will participate in these meetings if requested by the Utility Owner or DB Contractor, or otherwise as TxDOT deems appropriate.

Before distribution of any mass mailings to Utility Owners, DB Contractor shall submit to TxDOT, 21 Days in advance of distribution, for its review and comment the form, content, and addressees of any such mass mailings. For purposes of this Section 6, the term "mass mailing" means correspondence that is sent to 50% or more of Utility Owners within a three (3) week time period, and contains substantially the same content with respect to each Utility Owner.

6.2.2.2 Meetings

At least three (3) Business Days in advance of each scheduled meeting, DB Contractor shall provide notice and an agenda for the meeting separately to TxDOT and, if necessary, to the appropriate Utility Owner. DB Contractor shall prepare minutes of all meetings and shall keep copies of all correspondence.

DB Contractor shall prepare meeting minutes within five (5) Business Days after the conclusion of such meetings. At a minimum, DB Contractor shall include the following items in the meeting minutes:

a) A complete list of attendees (including their affiliations, telephone numbers, and e-mail addresses)

b) Documentation of the issues discussed and any associated solutions

c) Description of remaining open issues and action items (including the person(s) responsible for follow-up and target date for resolution)

DB Contractor shall submit draft versions of all meeting minutes to TxDOT for review before distributing final versions to the meeting attendees and appropriate Customer Groups.

6.2.3 Utility Adjustment Team

DB Contractor shall provide a Utility Adjustment team with appropriate qualifications and experience for the Utility Adjustment Work. DB Contractor shall provide the names and contact details, titles, job roles, and specific experience of the team members in the PMP. Specifically, DB Contractor shall provide a Utility Manager (UM) and a Utility Design Coordinator (UDC) to manage all aspects of the Utility Adjustment Process. If the DB Contractor assigns the construction activities to a Subcontractor or subsidiary, the DB Contractor shall provide a DB Contractor Utility Coordinator (DUC) as described herein.

The UM's primary work responsibility shall be the performance of all DB Contractor's obligations with respect to Utility Adjustments. The Utility Manager shall have a bachelor's degree, and have at least four (4) years of relevant experience in coordinating and solving complex utility adjustments on highway improvement projects. DB Contractor shall authorize the Utility Manager to approve all financial and technical modifications associated with Utility Adjustments, and modifications to the Utility Agreement.

The UDC shall be a Registered Professional Engineer (PE). The UDC shall be responsible for coordinating the Utility Adjustment design with the overall highway design features during the planning, design, and construction phases of the Work.

If applicable, the DUC shall hold a bachelor's degree and have at least five (5) years of relevant experience in ROW and Utility coordination activities involving large transportation projects. The DUC will be responsible for tracking and following DB Contractor's subsidiaries and Subcontractor's activities and communicating the progress to the DB Contractor. The DUC will assist with developing good working relationships with the Utility Owners and assisting DB Contractor in all utility coordination matters.

6.2.4 Real Property Matters

DB Contractor shall provide the services described below in connection with existing and future occupancy of property by Utilities.

6.2.4.1 Documentation of Existing Utility Property Interests -- Affidavits

For each Existing Utility Property Interest within the Project ROW claimed by any Utility Owner, DB Contractor shall include an Affidavit of Property Interest in the applicable Utility Assembly, with documentation of the Existing Utility Property Interest (e.g., an easement deed) attached. Any such claim shall be subject to TxDOT's review as part of a Utility Assembly approval. Except as otherwise directed by TxDOT, DB Contractor shall prepare all Affidavits of Property Interest using the forms included in Attachment 6-1.

6.2.4.2 Acquisition of Replacement Utility Property Interests

Each Utility Owner will be responsible for acquiring any Replacement Utility Property Interests that are necessary for the Project. DB Contractor shall have the following responsibilities for each acquisition:

a) DB Contractor shall coordinate with, and provide the necessary information to, each Utility Owner as necessary for the Utility Owner to acquire any Replacement Utility Property Interests required for its Utility Adjustments;

b) If any of DB Contractor-Related Entities assists a Utility Owner in acquiring a Replacement Utility Property Interest, such assistance shall be by separate contract outside of the Work, and DB Contractor shall ensure that the following requirements are met:

   i) The files and records must be kept separate and apart from all acquisition files and records for the Project ROW;

   ii) The items used in acquisition of Replacement Utility Property Interests (e.g., appraisals, written evaluations and owner contact reports) must be separate from the purchase of the Project ROW; and

   iii) Any DB Contractor-Related Entity personnel negotiating the acquisition of Replacement Utility Property Interests must be different from those negotiating the acquisition of Project ROW.

DB Contractor is not responsible for Utility Owner condemnation proceedings except for DB Contractor's cost share set forth in Section 6.8.6 of the Agreement. The Utility Owner is responsible for utilizing its authority for condemnation proceedings for all Replacement Utility Property Interests.

6.2.4.3 Relinquishment of Existing Utility Property Interests

DB Contractor shall cause the affected Utility Owner to relinquish each Existing Utility Property Interest within the Project ROW whether occupied or not by a Utility, unless the existing Utility occupying such interest is either (a) remaining in its original location or (b) being reinstalled in a new location still subject to such interest.

6.2.4.4 Quitclaim Deeds

Except as otherwise directed by TxDOT, DB Contractor shall prepare a Quitclaim Deed for each relinquishment of an Existing Utility Property Interest using the TxDOT form included in Attachment 6-1. Each Quitclaim Deed is subject to TxDOT's approval.

DB Contractor understands and expects that a Utility Owner will not relinquish any Existing Utility Property Interest until after the Utility Adjustment has been accepted by the Utility Owner in its new location. Accordingly, instead of an executed Quitclaim Deed, the Utility Assembly for such a Utility Adjustment shall include a letter signed by the Utility Owner's authorized representative confirming that

the interest will be quitclaimed upon completion of the Utility Adjustment, with a copy of the unsigned Quitclaim Deed. In these cases, DB Contractor shall obtain the executed Quitclaim Deed within 90 Days of completion of the Utility Adjustment or unless otherwise approved by TxDOT in writing. The Quitclaim Deed must be approved by TxDOT prior to the DB Contractor recording such deed in the local real property records.

6.2.4.5 Utility Joint Use Acknowledgements and Utility Installation Request, Form 1082 Requirements

DB Contractor shall prepare a Utility Joint Use Acknowledgment (UJUA) for each Utility that will remain within the boundaries of its Existing Utility Property Interest location within the Project ROW. DB Contractor shall prepare all Utility Joint Use Acknowledgments using the TxDOT form included in Attachment 6-1. DB Contractor also shall prepare all required documentation to be included with each Utility Joint Use Acknowledgment.

DB Contractor shall arrange for the Utility Owner to execute each UJUA or Utility Installation Request, Form 1082, which shall be subject to TxDOT's written approval as part of a Utility Assembly.

DB Contractor shall prepare a Utility Installation Request, Form 1082 for each Utility that will remain or be relocated within the project ROW and is not located within an Existing Utility Property Interest held by the Utility Owner.

6.2.4.6 Documentation Requirements

DB Contractor shall prepare, negotiate (to the extent permitted by this Section 6.2.4, and obtain execution by the Utility Owner of (and record in the appropriate jurisdiction, if applicable) all agreements and deeds described in this Section 6.2.4, including all necessary exhibits and information concerning the Project (e.g., reports, Plans, and surveys). Each agreement or deed shall identify the subject Utility(ies) by the applicable Utility Assembly Number and shall also identify any real property interests by parcel number or highway station number, or by other identification acceptable to TxDOT.

6.3 Design

6.3.1 DB Contractor's Responsibility for Utility Identification

DB Contractor bears sole responsibility for locating and identifying, at its own expense, all Utilities located within the Project ROW or otherwise affected by the Project, whether located on private property or within an existing public ROW, and including all Service Lines.

DB Contractor shall prepare and submit to TxDOT, no later than 90 days after NTP2 or 30 days before the first Utility Assembly package is submitted, a DB Contractor Utility Strip Map showing the information obtained and/or confirmed pursuant to this Section 6.3.1. The DB Contractor Utility Strip Map shall show in plan view all Utilities within the Project ROW or otherwise impacted by the Project, in each case detailing the type of Utility (communication, gas, oil, water, etc.) size, material and the Utility Owner's name and contact information. The scale of the DB Contractor Utility Strip Map shall be 1"=100'. DB Contractor shall update the information provided in the DB Contractor Utility Strip Map with SUE data and shall submit the same to TxDOT in accordance with the PMP.

6.3.2 Technical Criteria and Performance Standards

DB Contractor shall ensure that all design plans for Utility Adjustment Work, whether furnished by DB Contractor or by the Utility Owner, are consistent and compatible with the following:

a) The applicable requirements of the DBA Documents, including Section 6.2.1;

b) The Project design;

c) Any existing and proposed Utility;

d) All applicable Governmental Approvals; and

e) Private approvals of any third parties necessary for such work.

6.3.3 Utility Adjustment Concept Plans

DB Contractor shall prepare and submit to TxDOT, no later than 90 days after NTP2 or 30 days before the first Utility Assembly package is submitted, a proposed conceptual Utility design (a Utility Adjustment Concept Plan) for the Project (or proposed Utility Adjustment Concept Plans for various segments of the Project, as appropriate), showing the approximate location of each existing Utility in accordance with Section 6.3.1, the existing Utilities to remain, proposed location of each Utility and DB Contractor's Utility Adjustment recommendations.

In accordance with the PMP, DB Contractor shall submit the proposed Utility Adjustment Concept Plans(s) to TxDOT for its review. The Utility Adjustment Concept Plan(s) shall be submitted in both tabular and plan formats. The tabular format shall identify and numerically list each utility conflict and each associated utility. The plan(s) shall be color-coded and shall utilize a scale that clearly depicts all of the required information. DB Contractor shall coordinate with the affected Utility Owners as necessary to obtain their respective concurrence with the Utility Adjustment Concept Plan(s) as initially submitted to TxDOT and with any subsequent revisions. The Utility Adjustment Concept Plan is a working document and DB Contractor shall modify the plan as the Work progresses and more project information becomes available. Each executed PUAA or UAAA will identify and approve the Utility location.

6.3.4 Utility Adjustment Plans

DB Contractor shall ensure that all Utility Adjustment Plans, whether furnished by DB Contractor or by the Utility Owner, are signed and sealed by a Registered Professional Engineer (PE), unless waived by TxDOT at its sole discretion, and per governmental regulations and industry practice.

6.3.4.1 Plans Prepared by DB Contractor

Where DB Contractor and the Utility Owner have agreed that DB Contractor will furnish a Utility Adjustment design, DB Contractor shall prepare and obtain the Utility Owner's approval of plans, specifications, and cost estimates for the Utility Adjustment (collectively, "Utility Adjustment Plans") by having an authorized representative of the Utility Owner sign the plans as "reviewed and approved for construction." The Utility Adjustment Plans (as approved by the Utility Owner) shall be attached to the applicable Utility Agreement, which DB Contractor shall include in the appropriate Utility Assembly for TxDOT's approval.

Unless otherwise specified in the applicable Utility Agreement(s), all changes to Utility Adjustment Plans previously approved by the Utility Owner (excluding estimates, if the Utility Owner is not responsible for any costs) shall require written Utility Owner approval. DB Contractor shall transmit any TxDOT comments to the Utility Owner, and shall coordinate any modification and re-approval by the Utility Owner and resubmittal to TxDOT as necessary to obtain TxDOT's approval.

6.3.4.2 Plans Prepared by the Utility Owner

For all Utility Adjustment Plans to be furnished by a Utility Owner, DB Contractor shall coordinate with the Utility Owner as necessary to confirm compliance with the applicable requirements as referenced in Section 6.2.1. Those Utility Adjustment Plans shall be attached to the applicable Utility Agreement, which DB Contractor shall include in the appropriate Utility Assembly for TxDOT's approval. DB Contractor shall transmit any TxDOT comments to the Utility Owner, and shall coordinate any

modification and review by DB Contractor and resubmittal to TxDOT as necessary to obtain TxDOT's approval.

6.3.4.3 Design Documents

Each proposed Utility Adjustment shall be shown in the Design Documents, regardless of whether the Utility Adjustment Plans are prepared by DB Contractor or by the Utility Owner.

6.3.4.4 Certain Requirements for Underground Utilities

Casing as specified in the UAR shall be used for all underground Utilities crossing the Project ROW. However, high-pressure gas and liquid petroleum pipelines may be allowed to cross the Project ROW without steel casing as long as the requirements of the UAR are met. All high-pressure gas pipelines within the Project ROW shall comply with a design factor "F" = 0.6 or less as required by the class location of the pipeline. The Utility Owner is required to submit or approve the Barlow's Formula calculation(s) in writing to be included in the Utility Assembly.

Underground communication facilities that cross the roadway, including side roads, shall be encased in Schedule 80 PVC or SDR 11 HDPE pipe up to and including 4" casings. Casings larger than 4" shall be steel pipe, unless other methods of protection are approved by TxDOT. Multiple conduits shall be encased in steel pipe, unless other methods of protection are approved by TxDOT.

Refer to Section 14 – Rail for certain design requirements for underground Utilities within the potential railroad corridor.

6.3.4.5 Utility Assemblies

Each Utility Adjustment in addition to each utility remaining in place in the Project ROW and not requiring any Protection in Place or other Utility Adjustment shall be addressed in a Utility Assembly prepared by DB Contractor and submitted to TxDOT for its review and comment, and for TxDOT's approval of any items for which this Section 6 requires TxDOT's approval. Temporary Utility Adjustments that are installed within the Project ROW must also be included with an assembly for TxDOT's prior approval unless TxDOT waives or allows other approval methods concerning Temporary Adjustments. Each Utility Adjustment shall be addressed in a full Utility Assembly, unless it is appropriate for a Supplemental Utility Assembly or Abbreviated Utility Assembly, as described below. DB Contractor shall coordinate with the Utility Owner to prepare all components of each Utility Assembly. Completion of the review and comment process for the applicable Utility Assembly, as well as issuance of any required TxDOT approvals, shall be required before the start of construction for the affected Utility Adjustment Work.

Provisions governing the procedure for and timing of Utility Assembly Submittals are in Section 6.5 (Deliverables).

All Utility Adjustments covered by the same initial PUAA can be addressed in a single full Utility Assembly.

Each set of the required Utility Assembly shall include the following:

a) A transmittal memo recommending approval and detailing any unique characteristics or information pertaining to the adjustment. The transmittal memo shall also describe any applicable amendment (UAAA) and explain why the amendment is necessary;

b) A completed Utility Assembly Checklist;

c) A TxDOT approved Utility Adjustment Agreement;

d) Plans which:

i) Show the existing and proposed Utility facilities;

ii) Show existing and proposed grades for all Utility crossings;

iii) Show the existing and Project ROW lines along with the control of access denial line;

iv) Show an offset distance from the Project ROW line to all longitudinal Utilities within the Project ROW;

v) Present sufficient information to enable TxDOT to verify compliance with the UAR requirements for each Utility located within the Project ROW, including highway design features; and

vi) Are folded to 8.5" x 11" size, unless waived by TxDOT.

e) Estimate(s) from the Utility Owner (and also from DB Contractor, where DB Contractor is furnishing design and/or performing construction), which estimates shall, without limitation, detail material type and quantity (material quantities detailed on the estimates must correlate to the materials shown on the plans described in (d) above), labor and engineering. The estimate must list and identify the estimated amount of reimbursement to the Utility Owner, taking into consideration the betterment credit calculation, salvage credit and any applicable eligibility ratio. The estimated cost(s) associated with DB Contractor's internal coordination costs and overheads shall not be included in this estimate;

f) A proposed Utility Joint Use Acknowledgement or Utility Installation Request, Form 1082;

g) Statement of Work form, if applicable;

h) Affidavit(s) of Property Interest form (with property interest instrument of conveyance attached), if applicable;

i) A ROW map showing the existing and proposed Utility facilities identified on a plan view. This ROW map will only be required to be included with TxDOT's copy of the Utility Assembly;

j) All Utility No Conflict Sign-Off Forms; and

k) Proposed starting date and estimated time to completion for the Adjustment.

Utility Adjustment Amendment Agreements (UAAA). For each UAAA, DB Contractor shall prepare an additional Utility Assembly for the relevant initial PUAA (an Assembly), covering all Utility Adjustments addressed in the UAAA. The UAAA Assembly shall contain all requirements listed in a) through k) as identified in this Section 6.3.4.5.

Abbreviated Utility Assemblies. DB Contractor shall prepare an Abbreviated Utility Assembly for each Utility proposed to remain at its original location within the Project ROW that is not required to be addressed in a PUAA or UAAA, unless an Adjustment is required pursuant to Section 6.1.1. If DB Contractor is reimbursing the Utility Owner any of its costs, a PUAA or UAAA is required. Each Abbreviated Utility Assembly shall contain a transmittal memo recommending that the subject Utility(ies) remain in place, a set of plans detailing UAR compliance, a completed Utility Assembly Checklist, a certification from the Utility Owner approving leaving the Utility(ies) in place, as well as Utility Joint Use Acknowledgment(s) or Utility Installation Request, Form 1082 as required in Section 6.2.4.5, Utility No Conflict Sign-Off Forms, plans detailing UAR compliance and Affidavit(s) of Property Interest, if applicable. Each of the foregoing items shall comply with the requirements for same described in Attachment 6-1.

6.4 Construction

6.4.1 Reserved

6.4.2 General Construction Criteria

All Utility Adjustment construction performed by DB Contractor shall conform to the requirements listed below. In addition, DB Contractor is responsible for verifying that all Utility Adjustment construction performed by each Utility Owner conforms to the requirements described below. In case of nonconformance, DB Contractor shall cause the Utility Owner (and/or its contractors, as applicable) to complete all necessary corrective work or to otherwise take such steps as are necessary to conform to these requirements.

a) All criteria identified in Section 6.3.2;

b) The Utility Adjustment Plans included in the Utility Agreement approved by TxDOT (other than Utility Adjustment Field Modifications complying with Section 6.4.7;

c) All Project safety and environmental requirements;

d) All pre-construction meeting requirements;

e) The ROW acquisition schedule described in Section 7; and

f) Utility(ies) standards provided in the Utility Agreement.

6.4.3 Reinstatement of Utility Cuts

After installation of drainage structures, storm sewers, or any other public or private Utility by open cut beneath existing pavements carrying traffic during construction, the pavement shall be promptly restored and maintained to a normal satisfactory riding surface equal to or better than the existing.

6.4.4 Inspection of Utility Owner Construction

DB Contractor shall set forth procedures in the PMP for inspection of all Utility Adjustment Work performed by Utility Owners (and/or their contractors) to verify compliance with the applicable requirements described in Section 6.4.2. DB Contractor is responsible for quality control and quality assurance for all Work performed by the Utility Owners and/or their contractors.

6.4.5 Scheduling Utility Adjustment Work

Certain Utility Adjustment Work (other than construction) may begin at any time following issuance of NTP1. Refer to Section 4.4 of the Agreement for the conditions to commence construction of the Utility Adjustment Work by DB Contractor. DB Contractor shall not arrange for any Utility Owner to begin any demolition, removal, or other construction work for any Utility Adjustment until all of the following conditions are satisfied:

a) The Utility Adjustment is covered by an executed Utility Agreement (and any conditions to commencement of such activities that are included in the Utility Agreement have been satisfied);

b) Pre-construction meeting, in accordance with Section 6.2.2.2, shall be required after execution of the Utility Agreement and prior to commencement of any construction activities, unless otherwise approved by TxDOT;

c) Availability and access to affected Replacement Utility Property Interests have been obtained by the Utility Owner (and provided to DB Contractor, if applicable);

d) If any part of the Utility Adjustment construction work that will affect the Project ROW, availability and access to that portion of the Project ROW has been obtained in accordance with the applicable requirements of the DBA Documents;

e) If applicable, the Alternate Procedure List has been approved by FHWA, and either (a) the affected Utility is on the approved Alternate Procedure List, as supplemented, or (b) the Utility Owner is on the approved Alternate Procedure List, as supplemented;

f) The review and comment process has been completed and required approvals have been obtained for the Utility Assembly covering the Utility Adjustment;

g) All Governmental Approvals necessary for the Utility Adjustment construction have been obtained, and any pre-construction requirements contained in those Governmental Approvals have been satisfied; and

h) All other conditions to that Work stated in the DBA Documents have been satisfied.

6.4.6 Standard of Care Regarding Utilities

DB Contractor shall carefully and skillfully carry out all Work impacting Utilities and shall mark, support, secure, exercise care, and otherwise act to avoid damage to Utilities. At the completion of the Work, the condition of all Utilities shall be at least as safe and permanent as before.

6.4.7 Emergency Procedures

DB Contractor shall provide Emergency procedures with respect to Utility Adjustment Work in the PMP. DB Contractor shall obtain Emergency contact information, establish Emergency procedures with each Utility Owner and immediately notify the Utility Owner in the event of rupture, break or damage to Utility Owner's Utility facilities.

6.4.8 Utility Adjustment Field Modifications

DB Contractor shall establish a procedure to be followed if a Utility Adjustment Field Modification (UAFM) is proposed by either DB Contractor or a Utility Owner, after the Utility Assembly (which includes the Utility Adjustment Plans) has been approved. The procedure shall contain, at minimum, the following processes:

a) The Utility Owner's review and approval of a Utility Adjustment Field Modification proposed by DB Contractor, or DB Contractor's review and approval of a Utility Adjustment Field Modification proposed by the Utility Owner. The UAFM shall have TxDOT approval prior to commencement of construction. All revisions shall be signed and sealed by a Registered Professional Engineer (PE), unless waived by TxDOT at its sole discretion;

b) Transmittal of Utility Adjustment Field Modifications to the appropriate construction field personnel; and

c) Inclusion of any Utility Adjustment Field Modifications in the Record Drawings for the Project.

DB Contractor shall cause the procedure to be followed for all Utility Adjustment Field Modifications, whether the construction is performed by DB Contractor or by the Utility Owner.

6.4.9 Switch Over to New Facilities

After a newly Adjusted Utility has been accepted by the Utility Owner and is otherwise ready to be placed in service, DB Contractor shall coordinate with the Utility Owner regarding the procedure and timing for placing the newly Adjusted Utility into service and terminating service at the Utility being replaced.

6.4.10 Record Drawings

DB Contractor shall provide Record Drawings to each Utility Owner for its Adjusted Utilities, in accordance with the applicable Utility Agreement(s).

DB Contractor shall provide Record Drawings to TxDOT (regardless of whether design and/or construction of the subject Utilities was furnished or performed by DB Contractor or by the Utility

Owner). These drawings shall show the location of, and label as such, all abandoned Utilities, shall show and label all other Utilities, whether remaining in place or relocated, located within the Project ROW or otherwise impacted by the Project, and shall otherwise comply with Section 2. DB Contractor shall provide the Record Drawings for each Adjustment to TxDOT no later than 90 Days after Utility Owner acceptance as defined in the Utility Agreement, the Adjustment or before such earlier deadline as is specified elsewhere in the DBA Documents.

DB Contractor shall provide, within 90 days after final Utility Adjustment is complete, a plan view of all final Utility locations (both Owner Managed and DB Contractor Managed) that include Utilities that remained in place, were Adjusted in place and/or relocated. The plan view must detail the Utility horizontal alignment with highway stationing, ROW lines, roadway features, Utility Owners name, Utility type, size and Utility Assembly Number. This overall inventory set of plans is separate from the individual record drawings required for each Utility Assembly. The plan view map shall be submitted for TxDOT review upon completion of 50% of the required Utility Adjustment Work.

6.4.11 DB Contractor Maintenance of Utility Service and Access

All Utilities shall remain fully operational during all phases of construction, except as specifically allowed and approved in writing by the Utility Owner. DB Contractor shall schedule Utility Adjustment Work in order to minimize any interruption of service, while at the same time meeting the Project Schedule and taking into consideration seasonal demands.

Each Utility Adjustment or remain in place location must allow for adequate access during construction and after completion of the Project. All access and access locations to the Utility must be agreed to by TxDOT and the Utility Owner.

6.4.12 Traffic Control

DB Contractor shall be responsible for the Traffic Management Plan. The Traffic Management Plan shall cover all traffic control made necessary by for Utility Adjustment Work, whether performed by DB Contractor or by the Utility Owner. Traffic control for Adjustments shall be coordinated with, and subject to approval by, the local agency(ies) with jurisdiction. Traffic control shall comply with the guidelines of the TMUTCD and of Section 18.

6.5 Deliverables

DB Contractor shall time all Submittals described in this section to meet the Project Schedule, taking into account the maximum number of Submittals set forth in this Section 6.5 or, if not stated therein, then as stated in Section 3.1 of the Agreement. All deliverables shall conform to the standards required in the Project Management Plan.

6.5.1 Maximum Number of Submittals

DB Contractor shall coordinate all Submittals required pursuant to this Section 6.5. In each ten (10) Business Day period, DB Contractor shall not submit more than:

a) Five (5) Utility Assemblies (excluding Abbreviated Utility Assemblies); and

b) Five (5) of any other Submittal required under this Section 6 and requiring TxDOT review and approval.

Where the number of Submittals exceeds these limits, the Submittals shall be considered excess and TxDOT may defer its review of any such excess Submittals to a subsequent ten (10) Business Day period, as necessary.

6.5.2 DB Contractor's Utility Tracking Report

DB Contractor shall maintain a Utility Tracking Report in tabular form, listing all Utilities located within the Project ROW or otherwise potentially affected by the Project. DB Contractor shall submit the Utility Tracking Report to TxDOT on a monthly basis in the format described below unless otherwise approved by TxDOT. The Utility Tracking Report shall, at a minimum, contain the following information for each utility:

a) The name of the Utility Owner and the Utility Assembly Number;

b) Utility size and type;

c) Location of the Utility based upon station and offset;

d) The proposed method of treatment;

e) State whether the Adjustment will be Owner or DB Contractor Managed;

f) Dates on which the PUAA/UAAA was executed by TxDOT, Utility Owner, DB Contractor;

g) Dates on which the UJUA or Utility Installation Request, Form 1082 was executed by the Utility Owner and TxDOT;

h) The Utility Owner's existing right of occupancy of the ROW for each Utility (e.g. UJUA, permit, easement or combination);

i) Whether any Replacement Utility Property Interest will be necessary;

j) Estimated cost approved in the PUAA or UAAA;

k) Amounts and dates of payments made by DB Contractor to the Utility Owner, listing in each case the type of payment (final, partial or lump sum);

l) Scheduled start and completion date for construction of each Adjustment;

m) Percent complete of construction; and

n) Whether any Betterment is included in the Adjustment

The Utility Tracking Report shall also include a separate section for Replacement Utility Property Interest including each necessary Replacement Utility Property Interest with the names of property owners or parcel number(s), Utility Assembly Numbers, status of the acquisition, acquisition cost and other information as necessary. DB Contractor shall maintain this section of the Utility Tracking Report and submit to TxDOT in the same manner as all other portions of the Utility Tracking Report.

6.5.3 Utility Assembly Submittals and Final Closeout Procedures

The following procedures shall govern submittal, review and final closeout of each Utility Assembly, including Supplemental and Abbreviated Utility Assemblies:

a) Before submitting a Utility Assembly to TxDOT, DB Contractor shall:

   a. Verify that each subject Utility (or the Utility Owner) is on the approved Alternate Procedure List, if applicable;

   b. Submit the complete Utility Assembly to the quality control/quality assurance entity designated by DB Contractor in accordance with the PMP; and

   c. Resolve all comments made by the quality control/quality assurance entity, coordinating with the Utility Owner as appropriate.

b) DB Contractor shall submit to TxDOT three (3) identical and complete originals of each Utility Assembly, each of which shall be bound and labeled "DB Contractor Copy," "TxDOT Copy," or "Utility Owner Copy," as appropriate. The "TxDOT Copy" shall be color coded and shall include the Project ROW map with the existing and proposed Utility facilities identified on a plan view. These Submittals shall be for TxDOT's review and comment, except for any components of the Utility Assembly for which TxDOT's approval is required by this Section 6.5;

c) DB Contractor shall submit to TxDOT a Utility Assembly Submittal Log with each Submittal or group of Submittals. The Utility Assembly Submittal Log shall establish the review priority.

TxDOT will review the Utility Assembly for compliance with the requirements of this Section 6.5.3, and within ten (10) Business Days will return the Utility Assembly to DB Contractor with the appropriate notations pursuant to Section 3.1 of the Agreement to reflect its responses. DB Contractor shall transmit any TxDOT comments to the Utility Owner, and shall coordinate any modification, review and approval by the Utility Owner and resubmittal to TxDOT, as necessary to resolve all TxDOT comments and/or obtain TxDOT's approval, as applicable. Upon (a) TxDOT's approval of any Utility Assembly components for which TxDOT's approval is required, and (b) completion of the review and comment process for all other Utility Assembly components, TxDOT will sign three (3) originals of any approved UJUA(s) and of any other components of the Utility Assembly for which this Section 6 requires TxDOT's signature.

DB Contractor shall provide closeout information and documentation within 90 days after each Utility has been relocated, fully reimbursed and accepted by the Utility Owner. The closeout information must contain the following:

a. The Utility Agreement form (PUAA, UAAA, et al);

b. "As-built" plans;

c. UJUA or Form 1082;

d. Quitclaim form (D-15-30); and

e. Actual cost and summary of the Adjustment.

DB Contractor shall address conditions of approval, if any, for each Utility Assembly prior to completing the final closeout procedure.

6.5.4 FHWA Alternate Procedure

DB Contractor will develop the Alternate Procedure List that includes the Utility Owner's name, approximate station numbers and estimated cost of Utility Adjustments. TxDOT is authorized by the FHWA to utilize the Alternate Procedure process. Upon receipt of the required information, TxDOT shall then consider and approve the list and notify the DB Contractor. Promptly upon determining that any additional Utility Owner not referenced on the Alternative Procedure List is impacted by the Project, DB Contractor shall transmit to TxDOT all documentation as referenced above in order to update the Alternative Procedure List.

TxDOT will notify the FHWA of the approval of the Alternate Procedure List.

7 RIGHT OF WAY (ROW)

7.1 General Requirements

DB Contractor's obligations in respect of the acquisition of Project ROW are set forth in Section 6 of the Agreement.

This Section 7 sets forth the ROW activities assigned to DB Contractor, including pre-acquisition and acquisition activities, and designates which ROW activities TxDOT will conduct. This section also sets forth the requirements applicable to the Work assigned to DB Contractor related to the acquisition of Project ROW. DB Contractor shall provide all services necessary to acquire title to the Project ROW, in form and substance acceptable to TxDOT, in the name of the State; relocation of displacees; and clearance/demolition of the improvements from the Project ROW, as more fully described in the following sub-sections.

Except as otherwise set forth in the Agreement, DB Contractor's Project ROW staff and/or Subcontractors will function as independent contractors while acquiring Project ROW, and not as an agent, representative, or employee of TxDOT.

If DB Contractor obtains a property agreement to facilitate design, construction or maintenance in relation to the Project, DB Contractor shall provide a copy of the agreement to TxDOT.

7.2 Administrative Requirements

7.2.1 Standards

DB Contractor shall acquire all Project ROW in accordance with State and Federal Law and the practices, guidelines, procedures, and methods contained in the following as they pertain to ROW:

a) TxDOT *Right of Way Manual* Collection (available online at http://onlinemanuals.txdot.gov/manuals)

b) TxDOT *Access Management Manual* (available online at http://onlinemanuals.txdot.gov/manuals)

c) *TxDOT Survey Manual*

d) TxDOT *ROW Appraisal and Review Manual*

Pursuant to the applicable federal regulations, DB Contractor shall (i) acquire ROW parcels for the Project on behalf of the State, but without the direct participation of TxDOT, subject to TxDOT's rights of review, approval, and audit; (ii) certify acceptance of the TxDOT *Right of Way Manual*; (iii) provide adequate access to all occupied properties; (iv) maintain Utility service to occupied properties until relocation is complete; and (v) not permit open burning within 1000 feet of an occupied dwelling.

DB Contractor shall maintain a complete set of the TxDOT *Right of Way Manual* Collection, Volumes 1 through 8 (available online at http://onlinemanuals.txdot.gov/manuals), TxDOT *Access Management Manual*, *TxDOT Appraisal and Review Manual*, and a current approved Project ROW map for public use. Any TxDOT forms referenced in this section may be found in the TxDOT *Right of Way Manual* Collection or will be provided by TxDOT.

All Project ROW activities must be completed and documented in compliance with all applicable Laws, including the Uniform Act, and the rules and regulations implementing the Uniform Act.

7.2.2 Software Requirements

DB Contractor shall employ software that is fully compatible with the software in use by TxDOT, or fully transferable to TxDOT's systems. DB Contractor must supply and maintain parcel-by-parcel status information that incorporates the fields and information required by TxDOT's ROW tracking system: ROWIS. DB Contractor must maintain and participate in any other required ROW tracking system required by the DBA Documents. The database shall be fully accessible to Persons authorized by TxDOT.

7.2.3 ROW Acquisition Plan

DB Contractor shall prepare a ROW Acquisition Plan in accordance with the requirements of this Section 7 and Section 2 (Project Management). The ROW Acquisition Plan shall set forth DB Contractor's organization including names, titles and qualifications of Key Personnel and other Project ROW personnel, integration of the Project ROW schedule into the Project Schedule, interface between design and Project ROW activities, documentation and reporting, quality control procedures and quality review standards.

The ROW Acquisition Plan shall contain, as a minimum, the following:

a) The name of TxDOT approved title company(ies) to be used for title services

b) The name and qualifications of the proposed ROW Acquisition Manager (ROW AM)

c) The resumes and qualifications for appraisers, appraisal reviewers, land planners, relocation agents, negotiators, real estate attorneys, eminent domain specialist and ROW personnel who shall have the minimum qualifications and experience specified in Section 7.2.7

The ROW Acquisition Plan shall establish the specific means by which DB Contractor will:

a) Provide sufficient personnel to achieve, in accordance with the Project Schedule, the goals and milestones established for Project ROW acquisition, relocation assistance, appraisals and appraisal review, and clearance/demolition of the improvements from the Project ROW.

b) Provide administrative support.

c) Provide for language, visually impaired or hearing impaired translation, as necessary.

d) Provide documentation and reports.

e) Produce and distribute acquisition and relocation brochures as approved by TxDOT.

f) Establish, implement, and maintain quality control procedures and quality review standards for the acquisition for Project ROW.

g) Prevent fraud, waste, and mismanagement.

DB Contractor shall update the ROW Acquisition Plan regularly, at least quarterly, in accordance with the DBA Documents.

7.2.4 Schedule and Review Procedures

The Project Schedule shall indicate the date to begin the acquisition of the Project ROW and the anticipated completion date of acquisition activities for each parcel. DB Contractor shall advise TxDOT of all Additional Properties and temporary rights or interests in real property to be acquired by DB Contractor. In developing the Project Schedule, DB Contractor will give priority to the acquisition of parcels that have significant impact on the Project Schedule and/or affect the Critical Path as so indicated. The monthly status reports required by Section 2.1.1 shall provide updated projections for the acquisition date of each parcel.

In developing the Project Schedule, DB Contractor shall incorporate adequate time periods for TxDOT review and approval of Acquisition Packages and Condemnation Packages. TxDOT intends to review the completed Acquisition Packages and Condemnation Packages as expeditiously as possible; however, for the purposes of the Project Schedule, DB Contractor shall assume that the reviews performed by TxDOT will require ten (10) Business Days for Acquisition Packages and Condemnation Packages (collectively) that DB Contractor submits as final and complete in accordance with Section 7.3.6 (Project ROW Acquisition Package Approval) and Section 7.4.4 Item 6 (Condemnation Support), up to a maximum of ten (10) Acquisition Packages and Condemnation packages (collectively). Any Submittals that would require TxDOT to review more than ten (10) Acquisition Packages and Condemnation Packages (collectively) within any given ten (10) Business Day period shall be considered excess, and TxDOT may defer its review of any such Acquisition Packages and/or Condemnation Packages to a subsequent ten (10) Business Day period (or periods as necessary). TxDOT will notify DB Contractor of its election to defer any excess Acquisition Packages and/or Condemnation Packages within ten (10) Business Days after receipt. The balance of Acquisition Packages and Condemnation Packages (collectively) in excess of ten (10) will be rolled over to the next ten (10) Business Day period and added to the Acquisition Package and Condemnation Package Submittals made by DB Contractor in that period. When DB Contractor submits more than ten (10) Acquisition Packages and Condemnation Packages (collectively) at any given time, DB Contractor shall indicate the priority of review.

DB Contractor shall also assume that the reviews performed by TxDOT will require ten (10) Business Days for the following Submittals: payment Submittals, relocation Submittals, administrative settlement Submittals, and closing Submittals, up to a maximum of ten (10) submissions for each type of Submittal noted above, in addition to the Acquisition Packages and Condemnation Packages.

If TxDOT notifies DB Contractor that any submitted Acquisition Package and/or Condemnation Package has a deficiency, DB Contractor shall correct such deficiency and resubmit the package to TxDOT. Resubmissions shall be treated as a new Acquisition Package and Condemnation Package (collectively) as described above. An Acquisition Package and/or Condemnation Package shall be deficient, as determined by TxDOT, if any of its components fails to meet any of the criteria established by this section for such component, or contains any material errors or omissions. Schedule delays resulting from inadequate or incomplete submissions of Acquisition Packages and/or Condemnation Packages shall be the responsibility of DB Contractor and will not be eligible for treatment as a Change Order.

TxDOT reserves the right to undertake additional review on Acquisition Packages and/or Condemnation Packages that contain or identify facts or issues of an unusual nature or which do not clearly fit within TxDOT standards and will notify DB Contractor in writing that the review period will be extended by an additional ten (10) Business Days before rendering a decision to DB Contractor.

DB Contractor may request TxDOT to do a preliminary review of the survey, Project ROW map and appraisal before the complete Acquisition Package is submitted. TxDOT may elect in its sole discretion to review the preliminary submission of the survey, map and appraisal and notify DB Contractor of any deficiencies after TxDOT's receipt and review of such preliminary submission.

7.2.5 DB Contractor's Project ROW Scope of Services

DB Contractor shall complete all administrative activities and prepare all documentation sufficient for DB Contractor to acquire the Project ROW. DB Contractor shall obtain TxDOT's review and prior written approval of all Project ROW maps and surveys, appraisals, legal descriptions, acquisition documentation, purchase price, requests to acquire Project ROW, condemnation-related activities, and funding/closing procedures. TxDOT will (i) approve and return the Project ROW acquisition documentation, (ii) provide review comments for incorporation by DB Contractor in accordance with Section 7.2.4 (Schedule and Review Procedures), or (iii) in the case of an Acquisition Package that is deficient, notify DB Contractor of the deficiency(ies) to be corrected by DB Contractor in accordance with Section 7.2.4 (Schedule and

Review Procedures). Except as otherwise authorized by applicable State and federal policy and regulations for early acquisition and approved by TxDOT, DB Contractor shall not proceed with acquisition of the Project ROW until all applicable Environmental Approvals have been obtained, public involvement procedures have been completed, and ROW maps and legal descriptions for the applicable constructible segment as established by the logical termini of the Project have been prepared and approved by TxDOT. TxDOT will provide a separate release for each approved segment. Further, DB Contractor shall not commence any negotiations with landowners nor will TxDOT begin eminent domain procedures until the specific Acquisition Package for that particular parcel is approved by TxDOT.

If DB Contractor and the landowner cannot negotiate an agreed-upon conveyance by deed, due to any specific issue (such as deed language, land/improvements value, damages to remainder), acceptable to TxDOT, TxDOT will initiate acquisition of the property through eminent domain procedures. DB Contractor shall not be permitted to commence any condemnation action through the statutory "Declaration of Taking" procedure without the express written consent of TxDOT. Consent may be withheld in TxDOT's sole and absolute discretion.

DB Contractor shall not begin construction on any parcel of real estate unless property rights for the parcel have been conveyed and recorded in favor of TxDOT, possession has been obtained through eminent domain or any other method as provided for in Section 7.2.1 (Standards), or a Possession and Use Agreement has been validly executed and delivered by all necessary parties in accordance with Section 7.4.1 (Project ROW Negotiations).

7.2.6 Acquisition Process Summary

DB Contractor's major activities with respect to the acquisition of the Project ROW include:

a) Project ROW surveying and mapping

b) Project ROW budget estimates and updates

c) Title services

d) Appraisal services

e) Appraisal review

f) Negotiations

g) Closing services

h) Relocation assistance

i) Condemnation support services

j) Clearance and demolition of Project ROW

k) Environmental due diligence

l) Documentation and document control

m) Progress reports

n) Project ROW administration and management

o) Project ROW quality management

p) Letter from DB Contractor's design engineer certifying that the required Project ROW acquisition is necessary and that any proposed alternatives are not feasible or are cost prohibitive

q) Obtaining rights of entry, as necessary

7.2.7 ROW Personnel Qualifications

DB Contractor's ROW Acquisition Manager shall have at least five (5) years of experience managing the acquisition of transportation ROW projects for a condemning authority, be licensed as a real estate salesman or broker pursuant to the *Texas Real Estate License Act* or rules established by the Texas Real Estate Commission, be familiar with appraisal and appraisal report review pursuant to the Uniform Standards of Professional Appraisal Practice (USPAP) and be familiar with the Uniform Act and applicable Laws of the State of Texas.

Quality Control Specialist(s) – DB Contractor shall designate a specific person(s) responsible for internal quality control and quality assurance. This individual will review all DB Contractor deliverables associated with survey, title, appraisal, acquisition, relocation and eminent domain prior to the deliverable being delivered to TxDOT for review. The Quality Control Specialist(s) shall report to the ROW Acquisition Manager, who shall oversee the quality control and assurance process.

Appraiser and Appraisal Reviewer – Each appraiser and appraisal reviewers shall be licensed and certified in the State of Texas and shall have a minimum of five (5) years' experience in appraising real property for eminent domain purposes, including partial taking appraisal, partial taking appraisal review and expert witness testimony. He or she must also have been actively and continuously engaged for at least three (3) years immediately preceding his or her selection for this Project in appraisal work primarily in Ellis and Tarrant Counties, or as approved and precertified by TxDOT. The appraisers and the appraisal reviewers shall have separate and distinct duties, and appraisers must be employed by different firms from the appraisal reviewers. Each appraiser shall be required to submit three (3) samples of previous appraisal work prepared for eminent domain purposes. All appraisers preparing and signing appraisals must be approved and precertified by TxDOT before performing any appraisals on the Project. If required by TxDOT, the appraiser will be required to demonstrate his/her skills at expert witness testimony.

Land Planner - Each land planner shall have a minimum of five (5) years' experience in land planning including experience with expert witness testimony in eminent domain proceedings. He or she must also have been actively and continuously engaged for at least three (3) years immediately preceding his or her selection for this Project in land planning work primarily in Ellis and Tarrant Counties, or as approved and precertified by TxDOT. DB Contractor shall provide a minimum of two (2) land planners to assist appraisers and complete land plans.

Relocation Agent - Each relocation agent shall have a minimum of three (3) years' experience in relocation assistance for ROW projects pursuant to the Uniform Act. A relocation agent's responsibilities shall include the following: Determination of eligibility of all displacees, contacting all displacees and informing them of their benefits, maintaining a file of all documentation concerning the relocation of the displacees, and extending all relocation assistance advisory services.

Negotiator - Each ROW negotiator shall be licensed either as a real estate sales person or broker pursuant to the *Texas Real Estate License Act* or rules established by the Texas Real Estate Commission, and shall be familiar with appraisal and appraisal report review pursuant to the USPAP. The negotiator shall have a minimum of three (3) years' experience in ROW negotiations. The ROW negotiator's responsibilities shall include the following: contact with property owners on the Project to discuss the acquisition of property needed for the Project, maintaining complete and accurate files of all transactions and contacts with the property owners and/or their representatives, and actively working toward a joint resolution to acquire the property with the property owner.

Eminent Domain Specialist – Each eminent domain specialist shall have a minimum of three (3) years' experience with TxDOT procedures and policies as related to acquisition of property through the use of eminent domain. The eminent domain specialist must be well versed in all activities necessary with the acquisition of parcels through the TxDOT Eminent Domain process. This includes correctly completing all TxDOT forms including the ROW-E-49, filing the eminent domain forms, coordinating the hearing

with all appropriate parties and ensuring that the award of special commissioners is deposited into the registry of the Court and all notices sent to the appropriate parties.

Real Estate Attorney - Each real estate attorney shall be licensed by the State of Texas and shall have at least five (5) years' experience in title review and curative matters. The real estate attorney's responsibilities shall include coordinating and clearing all title issues, and compliance assistance with State and federal acquisition requirements for the properties acquired for the Project.

ROW personnel shall have at least three (3) years' experience in title review and curative matters. ROW personnel's responsibilities shall include, but not be limited to the following: maintain complete and accurate files of all transactions and contacts with the property owners and/or their representatives, coordinate and clear all title issues and assist at closing for properties acquired for the Project.

7.2.8 DB Contractor Conflict of Interest

If at any time, DB Contractor or, to the best of DB Contractor's knowledge, any DB Contractor-Related Entity directly or indirectly (i) acquires or has previously acquired any interest in real property likely to be parcels of the Project ROW or the remainders of any such parcels; (ii) loans or has previously loaned money to any interest holder in any real property likely to be a Project ROW parcel and accepts as security for such loan the parcel, or the remainder of any such parcel that is not a whole acquisition, or (iii) purchases or has previously purchased from an existing mortgagee the mortgage instrument that secures an existing loan against real property likely to be a Project ROW parcel, or the remainder of any such parcel, DB Contractor shall promptly disclose the same to TxDOT. In the case of acquisitions, loans or mortgage purchases that occurred prior to the execution of the Agreement, such disclosure shall be made within ten (10) days after execution of the Agreement.

In the event that DB Contractor, or any subsidiary or parent company of DB Contractor, acquires a real property interest, whether title or mortgage, in parcels of the Project ROW, the real property interest acquired or a release of mortgage as the case may be, shall be conveyed to the State of Texas without the necessity of eminent domain.

DB Contractor shall not acquire or permit the acquisition by DB Contractor or any DB Contractor-Related Entity of any real property interest in a Project ROW parcel, whether in fee title or mortgage, for the purpose of avoiding compliance with the Laws, practices, guidelines, procedures and methods described in Section 7.2.1 (Standards).

7.2.9 Meetings

DB Contractor shall attend meetings as requested by TxDOT. At such meetings DB Contractor shall provide exhibits, take minutes, and distribute the minutes to all attendees for review and comment. Minutes will not be finalized until all attendees agree on content. DB Contractor shall provide meeting minutes to TxDOT within five (5) Business Days from the date of the meeting. TxDOT will respond within five (5) Business Days or at the next occurrence of the meeting. DB Contractor shall provide proposed agendas three (3) Business Days prior to each meeting.

7.2.10 Documentation and Reporting

DB Contractor shall provide TxDOT with all specific reports and supporting documentation for review and approval during the acquisition process. All correspondence with TxDOT and property owners relating to acquisition of real property shall include a heading with the following information (at a minimum):

a) County

b) Control Section Job (CSJ) number

c) Right-of-Way Control Section Job (RCSJ) number

d) Federal Project Number (if applicable)

e) Highway Designation

f) Project limits

g) Parcel number

h) Name of record owner(s)

i) DB Contractor shall utilize TxDOT's approved naming convention for all electronic files and reporting fields.

In administering and managing its Project ROW activities, DB Contractor shall:

a) Maintain parcel records on file of all aspects of the acquisition process in accordance with TxDOT requirements and applicable Law. Each parcel file shall include all documents required by the DBA Documents, the FHWA, and/or TxDOT.

b) Provide monthly summaries for the cost of Project ROW acquisition and related relocation assistance including amounts authorized and amounts paid on a parcel-by-parcel basis and budget forecasting on an overall Project basis as requested by TxDOT.

c) Maintain and electronically transmit to TxDOT, in a format acceptable to TxDOT, monthly status reports including appraisal, acquisition and relocation status of all parcels and activities related to Project ROW, acquisition and disposition of Additional Properties and acquisition and disposition of temporary easements or other property interests, and provide weekly (or as requested) updates to TxDOT.

d) Evaluate and report to TxDOT, Subcontractor status and performance on a monthly basis or more frequently as requested.

e) Prepare and submit electronically to TxDOT, on a monthly basis, a spreadsheet that contains Project ROW specific data required in order to complete the fields in TxDOT's ROWIS tracking software program or as directed by TxDOT.

a. Input and update parcel status in TxDOT approved web-based tracking system or as directed by TxDOT.

7.2.11 Responsibilities of DB Contractor

As set forth in Section 6.2 of the Agreement and as more fully described in this section, DB Contractor shall be responsible for the costs of all services and preparation of all documentation for all Project ROW acquisition, easement acquisition, permitting and related relocation assistance for the Project. The Work related to Project ROW acquisition includes mapping, surveying, environmental assessment, testing and remediation, appraisal, appraisal review, negotiation, acquisition, relocation advisory assistance and determination of relocation benefits to be provided, procurement of title insurance, clearing of title, closing of acquisitions, condemnation support including expert witnesses required by TxDOT and/or the Office of the Attorney General for all condemnation proceedings through special commissioner's hearings. DB Contractor shall also be responsible for all expert witness testimony, exhibits, transcripts, and photos associated with condemnation services and proceedings required by the Office of the Attorney General or TxDOT for special commissioner's hearings, jury trials and appeals, through Final Acceptance of the construction project or through any comprehensive lease, maintenance and/or operation agreement Term periods, whichever is longer.

DB Contractor shall not contact the Office of the Attorney General or an Assistant Attorney General handling a specific parcel that has been filed for eminent domain action or is in the process of settlement unless authorized by TxDOT.

DB Contractor acknowledges that DB Contractor has incorporated the value of saleable improvements into DB Contractor's Project ROW costs, and DB Contractor shall concurrently, with conveyance of the real property interest to the State of Texas, and without the necessity of further documentation executed by the State, obtain the rights to said saleable improvements. DB Contractor shall not be entitled to a credit for any improvements retained by a property owner. Upon conveyance of the real property interest to the State of Texas, DB Contractor shall comply with all applicable Laws with respect to relocation assistance and demolition.

DB Contractor shall also be responsible for the costs of acquisition and documentation for the acquisition of any temporary right or interest in real property not necessary for the Project but that DB Contractor deems advisable to acquire for work space, contractor lay-down areas, material storage areas, borrow sites, or any other convenience of DB Contractor. Except as otherwise authorized by Law for temporary areas necessary for construction of the Project, TxDOT shall not be obligated to exercise its power of eminent domain in connection with DB Contractor's acquisition of any such temporary right or interest, and TxDOT shall have no obligations or responsibilities with respect to the acquisition, maintenance or disposition of such temporary rights or interests.

DB Contractor shall be responsible for processing payment Submittals for request of payments and distributing all payments of: agreed purchase prices or court awards and judgments; special commissioner's awards; relocation assistance payments; all legal, administrative, and incidental expenses of, or related to, Project ROW.

DB Contractor is responsible for the payment of and all closing costs associated with the purchase of Project ROW in accordance with the Uniform Act and TxDOT policies.

DB Contractor's cost shall include all costs not paid by TxDOT.

DB Contractor shall also be responsible for submitting the completed files in accordance with the closeout procedures as defined by TxDOT within 90 days of the completed ROW activity. DB Contractor shall provide the following documentation including, but not limited to:

a. Appraisal report(s) (initial appraisal and all other issued appraisal reports, approved and/or not approved, with most recent appraisal report on top);
b. Conveyance document (PUA(s), deed(s), easement(s), judgment(s), Award of Commissioners);
c. Title insurance policy or attorney's certificate;
d. Memorandum of agreement; and
e. Negotiator's certificate.

For relocation and general correspondence, the following shall be included:

a. Relocation files (in chronological order);
b. Offer letters;
c. Negotiator Reports and/or contact sheets;
d. General correspondence; and
e. All other documentation regarding the parcel

7.2.12 Responsibilities of TxDOT

TxDOT will have the following responsibilities in connection with acquisition of Project ROW:

a) Except as otherwise set forth in this Section 7, provide final approval for all Acquisition Packages, Condemnation Packages, and payment Submittals relocation eligibility, relocation

appeals, relocation Submittals, administrative settlement Submittals, closing Submittals, court settlement requests, and other approvals required by the DBA Documents, by the State, or by applicable Law subject to submission requirements and timelines in Section 7.2.4 (Schedule & Review procedures).

b) After receiving a complete Condemnation Package from DB Contractor in accordance with Section 7.4.4 (Condemnation Support), and Section 7.2.4 (Schedule & Review procedures), TxDOT will submit a minute order request on the agenda of the next scheduled Texas Transportation Commission meeting; provided the completed Condemnation Package is submitted ten (10) Business Days before the Commission's required deadline for eminent domain minute order requests.

c) After receiving a complete payment Submittal from DB Contractor in accordance with Section 7.4.6 (Payment Submittal), and Section 7.2.4 (Schedule & Review procedures), TxDOT will submit a payment request to the Comptroller's Office. Upon receipt of the State warrant, TxDOT will relay the State warrant to DB Contractor within (5) five Business Days.

d) TxDOT will coordinate with the Office of the Attorney General to provide legal counsel to prepare and deliver to TxDOT the condemnation petition within 20 Business Days after the Attorney General's receipt of the Condemnation Package, including Commission minute order approval. TxDOT will deliver the condemnation petition to DB Contractor within ten (10) Business Days after receipt of the condemnation petition from the Office of the Attorney General.

e) If applicable, TxDOT will provide all e-filed documents to DB Contractor as part of DB Contractor's support of condemnation process and invoice DB Contractor for all e-filed charges. DB Contractor is responsible for reimbursing TxDOT all e-filed invoices.

f) TxDOT will provide all coordination services between DB Contractor and the Office of the Attorney General for prosecution of jury trials.

g) TxDOT will provide a ROW Administrator to serve as the point of contact for all Project ROW issues as set forth in 23 CFR § 710.313(d). TxDOT will facilitate an office for review of all submissions as described above and will have ultimate approval authority for said submissions.

h) TxDOT will review and approve the completed, final closeout files in accordance with the closeout procedures.

7.2.13 TxDOT Project Monitor/Reviewer

In addition to its review and approval authority as expressly set forth in other provisions of this Section 7, TxDOT may, at its sole discretion, audit and/or monitor the ROW activities and services performed by DB Contractor. TxDOT may contract with independent consultants to assist it in fulfilling the audit/monitoring function provided that the audit authority is not delegated. In addition to any of the matters specifically required to be provided by DB Contractor to TxDOT pursuant to the foregoing sections, DB Contractor shall provide information to TxDOT as requested to assist in its review and assessment of the progress, timeliness, adequacy, or sufficiency of DB Contractor's Project ROW activities.

7.2.14 Responsibilities of the Office of the Attorney General

The Office of the Attorney General, with the assistance of DB Contractor and coordination of TxDOT, shall be responsible for implementing all necessary legal actions for acquiring and obtaining possession of the Project ROW (and any necessary temporary construction easements approved by TxDOT for acquisition by condemnation) through the eminent domain process and eviction process. The responsibilities of the Office of the Attorney General will include:

a) Represent TxDOT as the State's Attorney of Record

b) Preparation of complete petitions for condemnation with the appropriate court for a cause number to be assigned

c) If applicable, e-file condemnation documents and coordinate delivery of filed documents with TxDOT.

d) Coordination with TxDOT on all legal matters concerning acquisition processes, including negotiated settlements

e) Analysis of recommended parcel values and/or appraisal issues

f) Additional legal advice and opinions as needed by TxDOT

g) Special commissioners' hearings

h) Jury trials including determination of expert witnesses and all appeals

i) Preparation, obtaining, and filing of all necessary legal documentation for eviction of property owners or tenants.

7.3 Pre-Acquisition Activities

7.3.1 Project ROW Surveying and Mapping

DB Contractor shall perform all Project ROW surveying and mapping and shall prepare Project ROW documents in accordance with applicable TxDOT standards, including the TxDOT *Right of Way Manual*, the *TxDOT Survey Manual*, and the *TxDOT GPS User's Manual* for any Additional Properties. DB Contractor shall refer to the current *Manual of Practice* by the Texas Society of Professional Land Surveyors and the *US National Map and Accuracy Standards*. DB Contractor shall refer to Section 9 (Land Surveying) for additional survey requirements.

The Project ROW map shall be prepared by DB Contractor and submitted to TxDOT for review and approval. The Project ROW map may be prepared in separate constructible segments established by the logical termini of the Project. TxDOT shall have ten (10) Business Days for review of each submitted ROW map, each containing up to a maximum of 25 parcels. Any Submittals that would require TxDOT to review more than 25 parcels within any given ten (10) Business Day period shall be considered excess, and TxDOT may defer its review of any such excess parcels to a subsequent ten (10) Business Day period (or periods as necessary).

DB Contractor may use Acquisition Survey Documents prepared by TxDOT, if available, for the purpose of performing ROW acquisition work at DB Contractor's risk.

DB Contractor shall assemble an Acquisition Survey Document to be included in the submission of the Acquisition Survey Document package. The Acquisition Survey Document package shall include:

a) Three (3) half size ROW maps on paper, Scale 1"= 100' (11"X 17").

b) One (1) separate set of Originals signed and sealed by RPLS, legal descriptions and parcel sketch, traverse closure sheets and a copy of the parent track deeds and subdivision plat if tract is a platted lot.

c) A CD with DGN Master File, Map Sheets, Excel Point List and Raw Data File and/or Field Notes and scanned copies of the instruments of record or other pertinent documents.

d) One (1) full size ROW map on paper, Scale 1" = 50' (22"x34").

e) One (1) set of folders for each parcel, Parts 1 & 2, etc., would be considered one folder. With one (copy signed and sealed) legal description, sketch, closure sheet, parent tract deed and subdivision plat if tract is a platted lot (and bi-section if applicable) secured inside on the right side.

f) Three (3) copies (signed and sealed) of each legal and sketch.

g) One (1) separate set (copies) of legal and sketch of each parcel for TxDOT records.

h) One (1) separate set (copies) of legal and sketch of each parcel for Title Company.

i) One (1) separate set of Originals legal and sketch signed and sealed by R.P.L.S. to be kept in mapping files.

DB Contractor shall prepare all Project ROW surveying and mapping in accordance with the following supplemental specifications:

a) DB Contractor shall assemble an Acquisition Survey Document. The Acquisition Survey Document shall include the Project ROW map, a parcel (metes and bounds) description, and a parcel plat, with a closure report for each of these three items for each of the parcels to be acquired. The latter three (3) items shall be on standard 8½" x 11" bond paper. The Project ROW map sheets shall be on 22" x 34" paper. Each final submission to TxDOT shall include two (2) sets of each document, unless otherwise directed. Each map sheet and document page shall have an "as of" date near the lower right hand corner. The parcel plat and parcel description for a given parcel should show identical "as of" dates.

b) The ROW map sheet and plat shall show all areas of denied access for the parcel according to the current TxDOT *Access Control Management Manual* and amendments.

c) The point of beginning (POB) shall be located on the proposed Project ROW line and shown in all documents with its centerline (survey baseline) station and offset or as reviewed and approved by TxDOT.

d) The point of commencing (POC), where applicable, shall be a well-defined monument or monument of record, and shall be tied to the POB by measured bearing and distance. The POC shall not be located on any proposed Project ROW line, or existing Project ROW line within the proposed Project ROW.

e) The centerline (survey baseline) station and offset shall be shown on the Project ROW map sheets for all significant points along the Project ROW line such as point of curvature (PC), point of tangency (PT), point of intersection (PI), point of compound curvature (PCC), and point of reverse curvature (PRC), and for property line intersections (PLI) with the Project ROW line, and for any other monumentation points on the Project ROW line.

f) The centerline (survey baseline) station and offset shall be shown in the parcel description and parcel plat at the beginning and ending, being the points with the lowest station and the highest station, of each parcel along the proposed Project ROW line.

g) Project ROW map sheets shall include all curve data, with the station and coordinates of the PI, and the stations at each end (PC, PT, PRC, PCC), for every centerline (survey baseline) curve on that map sheet.

h) Any existing ROW lines being incorporated into the proposed Project ROW, including intersecting ROW, shall be surveyed and monumented (if not previously monumented).

i) All Project ROW maps (and on the title sheet) and all parcel descriptions (at the end of the description) shall include a notation that identifies the State Plane Coordinate System and UTM zones, datum (NAD83) (1993 adj), or as shown on the current ROW maps, and the Project grid-

to-surface coordinate adjustment factor or refer to Primary Project Controls provided by TxDOT (refer to Section 9.3).

j) A Project ROW map title sheet with signature blocks shall be produced for each portion of the Project. DB Contractor shall sign the Project ROW map.

k) All Project ROW maps shall include a control sheet (or sheets), to show the primary survey control points with their location relative to the Project.

l) The parcel description and parcel plat documents shall all be referenced as parts of the exhibit recorded with the deed, so the pages shall be numbered accordingly. For example, if the parcel description is two pages, the parcel plat is one page, and then the first page of the parcel description is denoted "Page 1 of 3", the parcel plat is denoted "Page 3 of 3".

m) Improvements within 100 feet outside of all proposed Project ROW shall be depicted on the Project ROW map sheets. All improvements should be current as of the date of the on-the-ground property survey.

n) All visible improvements (buildings and structures) within 50 feet outside of the proposed Project ROW line shall be located by an "on-the-ground" survey and documented on the Project ROW map sheets and the parcel plats by measured offset distance from the proposed Project ROW line. Clearly indicate which distances are surveyed on–the-ground.

o) Calculated points shall be shown by a symbol on the drawing, with their relationship to the found reference points.

p) All property, city, county, abstract, section and survey lines shall be indicated appropriately. A map legend should clearly define the line styles and symbols used.

q) Upon final submittal from DB Contractor of the Project ROW documents to TxDOT, DB Contractor shall cause the surveyor to mark on the ground, using permanent and stable monuments as defined in Section 663.17 of the General Rules of Procedures and Practices of the Texas Board of Professional Land Surveying (TBPLS), all significant points along the Project ROW line, as described above, and all property line intersections with the Project ROW line. TxDOT requires these monuments to be a 5/8-inch iron rod, driven just below surface level, capped by a TxDOT-labeled aluminum cap (rod-and-cap monument).

r) Prior to acceptance of the ROW maps and surveys by TxDOT, DB Contractor shall cause a TxDOT Type II monument to be set at all significant points on the Project ROW line and at intersections with existing Project ROW lines, replacing monuments as described above (construct according to TxDOT specifications), unless otherwise directed by TxDOT.

s) As part of the survey process, DB Contractor shall cause a TxDOT Type II monument to be set at all significant points such as PCs, PTs, angle points and at 1500 foot intervals along tangent sections on the Project ROW line and at intersections with existing Project ROW lines, replacing monuments as described above, unless directed by TxDOT. Project ROW line intersections with property lines shall remain monumented by a 5/8-inch iron rod with a TxDOT aluminum cap (rod-and –cap monument). A TxDOT Type II monument shall be set on the Project ROW lines, perpendicularly left and right of each significant centerline point, regardless of the relative orientation of the final Project ROW line.

t) For any required revisions, DB Contractor shall resubmit to TxDOT all documents pertaining to the parcel to reflect the most recent revision date, and shall add a notation on the appropriate documents to state briefly the reason for the revision.

u) Documents shall contain deed references (survey name, abstract number, volume and page or document number, grantee, and area) for all existing public ROW encountered within the Project limits. If there is no recorded information found, a note shall state "Based upon our research, there appears to be no recorded vesting deed for the public ROW as shown hereon".

v) The documents produced by the surveyor are the property of TxDOT, and release of any document shall be subject to TxDOT's prior written approval.

w) DB Contractor shall cause the surveyor to include the denial of access line on the Project ROW map sheets and on the parcel plats, as required for controlled access facilities. DB Contractor also shall cause the surveyor to describe the area of denied access in the parcel description and monument on the ground with a 5/8" iron rod with a TxDOT aluminum cap stamped "TxDOT ADL" the limits of the denial of access.

x) The Project ROW map and each parcel plat shall include a parcel information table containing the areas, expressed in square feet, of the following: 1) the parent ownership as stated in all adjoining record vesting deeds or converted from the stated record acreage in those vesting deeds; 2) the parcel to be acquired as shown on the closure report for that parcel, and; 3) the remainder tract (item 1 minus item 2). If the parcel to be acquired consists of multiple parts, the Project ROW map shall show the net remainder. The parcel information table shall also contain the areas, expressed in acres, of the parent tract, the parcel to be acquired, and the remainder. This acreage (except stated record) shall be converted from the square footage as contained in the table. A note shall be included on the Project ROW map and on each parcel plat stating: "The acreage calculated and shown hereon is converted from the square footage shown hereon, and is for informational purposes only." Parcels with area less than one acre will not require acreage units to also be shown. All parcels, including parcels acquired by TxDOT or other Governmental Entity, shall be included on the Project ROW map.

y) Within the proposed Project ROW, all property owned by a city, county, or other local public agency (LPA) in fee or easement that does not have a vesting deed shall be identified by a parcel number and included on the Project ROW map. DB Contractor shall cause the surveyor to prepare a parcel description and parcel plat for use as an exhibit in the Project ROW acquisition (property transfer) documents.

z) DB Contractor shall cause an independent Registered Professional Land Surveyor (RPLS) to review the Acquisition Survey Document package for consistency as to the information delineated thereon and for compliance with all applicable Technical Provisions and survey documents. The boundary location and the survey methods remain the responsibility of DB Contractor, and are not part of this review process. TxDOT will have no obligation to accept the Acquisition Survey Document package as complete until the reviewing RPLS has signed and sealed the compliance certificate (compliance certificate form to be provided by TxDOT).

aa) Parcel numbering shall follow the TxDOT *ROW Manual*. Parcels are to be numbered based upon the parent tract. DB Contractor shall revise parcel numbering due to subsequent transactions as in the following example: From a 50-acre parent tract, with a proposed Project ROW acquisition parcel identified as Parcel 14, a 5-acre tract is sold which will also require Project ROW acquisition. The result is, Parcel 14 is "Not Used", and the two new Project ROW acquisition parcels are identified as Parcel 14A and 14B. If the property containing Parcel 14B sells a portion, then 14B is "Not Used" and the new Project ROW acquisition parcels are identified as Parcel 14C and 14D, etc. DB Contractor shall not use the letter "E" to avoid confusion with easement designations. Parcel numbering shall be sensitive to the appraisal of the required parcels.

bb) Complicated portions of a Project ROW acquisition survey can cause the Project ROW Map to be very difficult to read. TxDOT's preferred solution is to create an additional Project ROW map sheet or sheets for details, curve data, general notes, etc. The primary page would still retain the whole property inset, record ownership data, and most of the usual information. The additional sheet(s) should be clearly referenced and be numbered as the next sequential page(s). Pages numbered with a letter added (for example: 6A, 6B) are for revisions and corrections. DB Contractor shall use the preferred solution unless TxDOT approves an alternate method.

cc) An ownership sheet or sheets, containing an index to the information for all the parcels, shall be included and located near the beginning of the Project ROW map, after the title sheet and control sheet. The ownership sheet index shall include the parcel numbers, the names of the property owners, the vesting deed recording information, the record area of the parent tract, the area of parcel(s) to be acquired, the area of the remainder(s) left and right, the beginning and ending stations of the parcel along the Project ROW line, and the sheet number in the Project ROW map where the parcel is located.

dd) At property corners where more than one monument is found, a detail shall be provided to show the measured relationship between the monuments found and the monument set or held.

ee) DB Contractor shall purchase all materials, supplies and all items necessary for proper survey monumentation. DB Contractor may purchase Type II monuments from TxDOT. TxDOT shall make available for pick-up by DB Contractor Type II monuments within 75 Days after TxDOT receives from DB Contractor a written order, specifying the number of monuments to be purchased. Payment for TxDOT-supplied monuments shall be due within 30 Days after TxDOT delivers to DB Contractor a written invoice. DB Contractor may use these monuments only for this Project and shall be responsible for proper storage thereof.

ff) DB Contractor at the request of the property owner or TxDOT shall re-stake the proposed ROW with a flagged wooden stake.

Design Certification. DB Contractor shall provide sufficiency of design to determine the ROW need and produce ROW maps that delineate the proposed ROW and potential impacts to the remaining ROW. A design certification of ROW will be provided by DB Contractor for each parcel which confirms that the proposed ROW acquisition is adequate and necessary to construct and perform operations and maintenance on the Project and that other ROW acquisition alternatives are not feasible and/or cost prohibitive.

7.3.2 Additional Reporting Requirements

In addition to the Project ROW map, parcel description, and parcel plats, DB Contractor shall provide the following reports and electronic files:

a) Monthly Parcel Report: DB Contractor shall provide a report, prior to the first of the month, listing all parcel deletions, parcel additions, and parcel splits.

b) Monthly Progress Report: DB Contractor shall provide a report of all survey activity that occurred during the previous month, including a two-week look ahead of anticipated survey activity.

c) CAD Files: DB Contractor shall provide digital CAD files in MicroStation format which includes: property lines and/or existing ROW lines, as surveyed; proposed ROW lines; parcel numbers; resource files; level assignments; and plot files. DB Contractor shall submit CAD files prior to submitting the first Acquisition Package, and provide updates as needed.

7.3.3 Title Services

With respect to title services, DB Contractor shall comply with the applicable standards identified in Section 7.2.1 of the Technical Provisions, including the following requirements:

a) Select and contract with one or more title companies approved by TxDOT and deliver to TxDOT a five year sales history, a preliminary title commitment or preliminary title report, and, if necessary or appropriate, copies of all underlying documents and a plot of all easements, including Existing Utility Property Interests, referenced therein for each parcel (including fee acquisitions, slope easements, other drainage and roadway ROW or easements and abandonment of utility easements) to be acquired by TxDOT for the Project. Each title report shall be dated not more than 90 Days prior to the date of submittal to TxDOT of the Acquisition Package for such parcel. DB Contractor shall, at its own cost, review each title report to ensure that it complies with the format required by the DBA Documents. DB Contractor shall, at its own cost, retain the services of a real estate attorney, licensed and located in the State of Texas, to be available for title support and acquisition assistance. All title reports must be in the following required format: clearly indicate which exclusions and exceptions shall be deleted upon acquisition of the subject parcel, and clearly indicate any required deliverables to the title company to clear identified exclusions and exceptions. Title reports shall be in accordance with Good Industry Practice. DB Contractor shall notify the title company, by letter, which exceptions should be removed, including easements that (a) are appurtenant to and/or of benefit to the parcel but not included in the parcel to be acquired, and (b) are a burden on the parcel and not acceptable.

b) Review the preliminary title commitment or report to ensure that all current owners of record title are contacted and that negotiations or condemnation actions are conducted with all appropriate parties.

c) Work with the current owners of record title to each parcel or interest in a parcel or their designee and all other appropriate parties to clear any title exceptions or exclusions not acceptable to TxDOT.

d) Secure an owner's policy of title insurance in the amount of the total acquisition cost, to include cost of the property, improvements and damages to the remainder of the property, for each parcel from a title company acceptable to TxDOT for each parcel acquired, whether by deed or eminent domain judgment, insuring title as required by TxDOT. All Project ROW shall be acquired, and TxDOT's title in the Project ROW shall be insured, in fee simple absolute or easement interest as appropriate, free and clear of any and all liens and encumbrances. Title policies must be in a form and substance approved by TxDOT. Title to the Project ROW shall be insured in the name of the "State of Texas by and through the Texas Transportation Commission."

7.3.4 Introduction to Property Owners

TxDOT shall prepare and send out initial contact letters of introduction for both property owners and displacees, with the assistance and at the cost of DB Contractor. The letters shall clearly describe the Project, TxDOT's need for the owner's property, and shall include the name and telephone number of a DB Contractor's representative. TxDOT's ROW Administrator or his/her designee will sign the letters on TxDOT letterhead. The forms for these letters will be approved by TxDOT prior to use. Property owners or displacees unable to read or understand the notice must be given appropriate translation.

DB Contractor shall send a copy of the State of Texas Landowner's Bill of Rights for each property owner and submit a copy to be included with the letter of introduction. The copy of the Bill of Rights shall be the latest version as shown on the Office of the Attorney General website, https://www.oag.state.tx.us/agency/Landowners_billofrights.pdf.

7.3.5 Appraisals

7.3.5.1 Appraisal Services

DB Contractor shall provide TxDOT with fair market value appraisals prepared by appraisers meeting the minimum qualifications established herein. DB Contractor shall ensure that all appraisals are prepared in conformance with applicable Law (including the Uniform Act), and in accordance with professional appraisal methods and applicable TxDOT standards for all parcels to be acquired by TxDOT. DB Contractor shall:

a) Select appraisers from TxDOT's list of precertified fee appraisers and meeting the requirements specified in Section 7.2.7 (ROW Personnel Qualifications). TxDOT shall have final approval of the selection of each appraiser and appraisal reviewers submitted by DB Contractor. DB Contractor must identify and receive written approval of the appraiser who will be responsible for the appraisal work product and who will be signing the reports.

b) Establish personal pre-appraisal contact with each owner of record title and each occupant, and document all contacts utilizing forms provided by TxDOT.

c) If necessary, make a diligent effort to secure a written agreement between the record title owner and DB Contractor granting TxDOT, DB Contractor or assignees permission to enter the applicable parcel to be acquired (a "Right of Entry Agreement"). DB Contractor may at its sole discretion and expense offer to pay reasonable compensation for any required Right of Entry Agreements. If DB Contractor, after best efforts, is unable to secure a Right of Entry Agreement from the property owner, DB Contractor shall provide documentation acceptable to TxDOT indicating conversations, correspondence, and efforts used to attempt to secure the Right of Entry Agreement.

d) Contact the record title owners or their designated representatives, in writing, to offer them the opportunity to accompany the appraiser on the appraiser's inspection of the parcel, and maintain a record of all such contacts and attempts to contact in the parcel file.

e) Cause the appraiser to prepare a complete appraisal report for each parcel to be acquired to include the whole property, the portion to be acquired, and any damage to the remainder. It shall also include all improvements on the whole property, unless otherwise directed by TxDOT. The appraisal reports shall comply with and include all matters required by this section and TxDOT ROW related manuals, and shall satisfy the requirements of the USPAP in effect at the time the appraisal is submitted. Special analyses, studies or reports, as necessary, shall be made a part of each appraisal. The appraiser must use the most current edition of the standards referenced above and continually monitor these standards to ensure the appraisals conform to the most current requirements of professional appraisal practice. All appraisals shall utilize TxDOT Form ROW-A-5 - Real Estate Appraisal Report unless otherwise authorized by the TxDOT *Right of Way Manual* or TxDOT *Appraisal and Review Manual*; however, all appraisals for condemnation proceedings shall utilize TxDOT Form ROW-A-5 - Real Estate Appraisal Report.

f) Obtain and provide TxDOT with copies of all written leases, licenses and other occupancy agreements, including outdoor advertising/sign agreements that are not already included in the Title Commitment, in order to identify lessees, licensee and other occupants with potential compensable interests in each parcel and to determine the value of each such interest.

g) Perform an evaluation of all outdoor advertising signs, as required, utilizing the appropriate forms as instructed by TxDOT.

h) Cause the appraiser(s) to testify as an expert witness(es) or provide expert witness(es) approved by TxDOT in special commissioners' hearings or eminent domain proceedings through jury trial

and be available for depositions, other discovery, pre-hearing or pre-trial meetings and appeals, as directed by TxDOT. DB Contractor shall also provide administrative and/or technical support for such proceedings as requested by TxDOT.

i) Coordinate with the review appraiser regarding corrections and/or additional information that may be required for a particular appraisal.

j) Cause a report to be prepared by an environmental professional that meets the qualifications set forth in ASTM E-1527-05, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process, or provide a report in a manner approved by TxDOT, documenting the environmental condition of each parcel, which may be based on field investigations and/or historical review, as appropriate for the particular parcel. The report shall be completed in coordination with the appraiser(s) and shall be available to the appraiser(s). A Phase I environmental site assessment or a report provided in a manner approved by TxDOT shall be performed for all properties and submitted with the Acquisition Package. If it is determined that there is a potential environmental risk based on the Phase I report or other reports then a Phase II investigation shall be performed and submitted to TxDOT before a payment request is submitted for the purchase of the parcel or a Condemnation Package is submitted for approval. A Phase III investigation shall be performed if the Phase II report justifies it. The Phase III report must indicate the approximate cost to remediate the parcel to achieve its current use and its highest and best use. DB Contractor shall prepare timely written notification to TxDOT of any environmental or other concerns associated with the Project ROW or Additional Properties to be acquired that could require environmental remediation or other special attention or which would cause a report to be prepared. In the event that DB Contractor has exhausted all means possible and is unable to access the properties to perform an ESA Phase II and/or III, DB Contractor may submit the Acquisition Package and Condemnation Package without the ESA reports. However, DB Contractor will be responsible for performing and receiving approval from TxDOT for all required ESAs after possession of the property has been obtained through condemnation before commencement of construction.

k) Engage the services of, and cause, a land planner to perform, or otherwise assist in the preparation of, any and all appraisals that involve a parcel with a valuation analysis indicating a highest and best use that is other than the current use of such parcel, or as directed by TxDOT for certain other appraisals. DB Contractor shall notify TxDOT in writing of each and every instance when the highest and best use of a parcel is different and TxDOT will determine to what degree land planner services will be utilized by DB Contractor.

l) Cause the appraiser(s) to prepare updated appraisals, as well as updated appraisal reviews, when required by TxDOT or as needed during eminent domain proceedings. An updated appraisal package shall comply with USPAP, specifically the Statement on Appraisal Standards No. 7 (SMT-7) and Advisory Opinion, AO-3. The term "Update of an Appraisal" is defined as "an extension of a complete or limited appraisal and report relied on by a client for a prior business decision." At a minimum, the updated appraisal report must include:

- A letter of transmittal with a specific reference to the original appraisal report, any changes in market conditions, since the original appraisal, any changes in the subject property since the original appraisal, a statement of the current value or extension of the original value opinion and the listing of the current date of value.
- An updated Page 1 from TxDOT Form ROW-A-5 – Real Estate Appraisal Report or Form ROW-A-6 – Real Estate Appraisal Report, as appropriate, with the current date of a recent inspection of the subject property and a current date of value. This form needs to have a

current signature and date by both the appraiser and the reviewing appraiser in the appropriate spaces on the form.

- Any qualifying and limiting conditions or general assumptions by the appraiser shall be clearly stated and attached.
- A copy of the survey and legal description of the property being acquired, current photographs of the subject property, clearly showing the area being acquired, even though the original appraisal report contained photographs of the subject and the area of the acquisition. If there are significant changes to the subject property, the area being acquired, access to the remainder property, damages to the remainder(s), market conditions, the subject property's highest and best use from the previous appraisal or significant changes in the approaches to value, the property shall be reappraised using either TxDOT Form ROW-A-5 – Real Estate Appraisal Report, or, when approved by TxDOT, TxDOT Form ROW-A-6 – Real Estate Appraisal Report, depending on the report used for the original appraisal. Appraisers shall refer to Sections 6.03 and 6.04 of the TxDOT *Appraisal & Review Manual* for additional guidance. DB Contractor shall follow these guidelines in producing updated appraisal reports and shall discuss specific updating requirements for any complex appraisals with TxDOT before beginning the assignment.

m) Prepare and deliver to TxDOT upon request, a copy of all file documents, as formally requested in discovery motions or request for production.

n) Complete and furnish, to the appraiser and Relocation Agent, TxDOT Form ROW-A-9 - Property Classification Agreement before appraisal is completed.

7.3.5.2 Appraisal Review

In connection with appraisal review, DB Contractor shall:

a) Select review appraisers from TxDOT's list of precertified fee appraisers and meeting the requirements of Section 7.2.7. The review appraiser selected must follow the appraisal guidelines and procedures found in Chapter 4 of the TxDOT *ROW Appraisal & Review Manual*.

b) Determine, in consultation with TxDOT, if additional appraisal reports or technical expert reports are required. Initiate, review, and reconcile each report required.

c) Review all appraisal reports for each parcel to determine consistency of methodology, supporting documentation related to the conclusion reached, and compliance with TxDOT standards, as defined in Section 7.3.5.1 (Appraisal Services) and this Section 7.3.5.2 (Appraisal Review), the TxDOT *ROW Appraisal & Review Manua*l, the *Uniform Appraisal Standards and Federal Land Acquisitions* and the requirements of the Appraisal Foundation's USPAP in effect at the time the appraisal is reviewed. The review appraiser must use the most current edition of the standards referenced above and continually monitor these standards to ensure the appraisals conform to the most current requirement of professional appraisal practice.

d) Inspect the subject properties and the sale properties used in direct comparison for each appraisal being reviewed.

e) Upon completion of the review outlined above, the appraiser shall certify in writing to TxDOT that all required standards have been met. This certification will occur by signing on Page 1 of each TxDOT Form ROW-A-5 (Real Estate Appraisal Report) or TxDOT Form ROW-A-6 (Real Estate Appraisal Report) in the block provided. The review appraiser will also complete TxDOT Form ROW-A-10 (Tabulation of Values) to accompany each appraisal.

f) For appraisal updates, the review appraiser shall perform a complete review of the updated appraisal, re-inspecting the subject property and the sales used, as of the current date of value. The review appraiser shall follow the procedures outlined in the TxDOT *ROW Appraisal and Review Manual*. A new TxDOT Form ROW-A-10 (Tabulation of Values) will be required for each updated appraisal ordered by DB Contractor.

g) In accordance with providing a Quality Control Specialist(s) as stated in Section 7.2.7, ensure that appraisal consistency and quality for the entire Project is monitored for Project-wide controls and consistency.

7.3.6 Project ROW Acquisition Package Approval

Acquisition Packages submitted by DB Contractor for TxDOT's approval shall include the following items, prepared for each parcel in accordance with the requirements of this section:

a) A cover sheet setting forth the following information for each parcel.

- Parcel number and number of parts
- Station number
- CSJ number
- Federal Identification Number (if applicable)
- Location of parcel
- Name of owner
- County and/or other jurisdiction
- Extent of acquisition (partial or whole acquisition)
- Type of conveyance (fee, easement, etc.)

b) A complete legal description of the parcel adequate to effect the desired acquisition of the parcel, signed and sealed by an RPLS. A legal description and parcel plat is required for each parcel. Control of access shall be addressed in all legal descriptions. All descriptions shall be in recordable form and shall be prepared in a form and manner acceptable to TxDOT in all respects.

c) The parcel plat, as prepared by the RPLS, and a half size (11" x 17") copy of the ROW map sheet(s) pertaining to the parcel, such plat to include control of access designations.

d) A title report, current within 90 Days, including copies of all documents identified in the exceptions listed therein and a plot of all easements identified therein. The Acquisition Package shall include DB Contractor's analysis of each preliminary title report or title commitment to determine potential problems and proposed methods to cure title deficiencies. DB Contractor shall perform title curative work. DB Contractor shall provide TxDOT with copies of all curative documents.

e) A copy of the appraisal report with an effective date less than 180 Days and all supporting documentation.

f) A copy of the environmental site assessment and all amendments as described in Section 7.3.5.1 (Appraisal Services).

g) A real/personal property report detailing the items making up each parcel are classified as real estate, tenant-owned improvements or personal property. Particular attention shall be paid to items that have questionable classifications. A completed TxDOT Form ROW-A-9 (Property Classification Agreement).

h) Replacement Housing Calculations, notification of business eligibility, completed displacee interviews, all comparables used in estimating the Replacement Housing Calculations, and letter to displacee(s) explaining Replacement Housing Calculations. Calculations and replacement housing benefit package shall be prepared and reviewed by a qualified consultant, in conformance with TxDOT's standard relocation procedures and applicable to State and federal Laws.

i) The proposed initial offer letter, memorandum of agreement, deed, and any other documents, which shall be prepared by DB Contractor as required or requested by TxDOT, on DB Contractor's letterhead or as otherwise directed. TxDOT will provide the format for preparing these documents. Documents referred to in this section are standardized by TxDOT and modification of standardized documents shall be kept to a minimum. All changes are subject to approval by TxDOT in writing, in TxDOT's sole discretion.

j) Any other required TxDOT forms, such as record of all contacts with the property owner or any party with a compensable interest.

No Acquisition Packages will be approved if performed or submitted by appraisers or agents not previously approved by TxDOT for this Project.

Upon TxDOT's prior written approval of the Acquisition Package, DB Contractor may proceed with the offer to the property owner.

7.4 Acquisition Activities

7.4.1 ROW Negotiations

DB Contractor shall conduct all negotiations in accordance with the requirements of applicable Law. In conjunction with negotiations, DB Contractor shall:

a) Within ten Business Days of TxDOT's approval of the Acquisition Package, contact each property owner or owner's designated representative, in person where practical, to present the offer and deliver an appraisal report (not more than 6 months old) and appropriate brochures. The approved appraisal shall be sent by certified mail, return receipt requested. A copy of the appraisal report for the subject property shall be provided to the property owner or authorized representative at the time of initial offer. All appraisal reports produced or acquired by TxDOT relating specifically to the property owner's property and prepared in the ten (10) years preceding the date of the offer must also be delivered to the property owner. DB Contractor shall also maintain a file record of receipt of appraisal signed by the property owner. DB Contractor shall also maintain follow-up contacts and secure the necessary documentation and title curative Work upon acceptance of the purchase offer.

b) At the time of offer, produce and distribute to all property owners and displacees, TxDOT-approved informational brochures, as appropriate. The ROW brochures shall be purchased by DB Contractor and shall include language about the use of the *Declaration of Taking* procedure if DB Contractor anticipates requesting the utilization of this procedure by TxDOT anywhere within the Project.

c) Identify lessees, licensees, occupants, or other parties with potential compensable interests including outdoor advertising sign owners, and, if appropriate, after consultation with TxDOT, negotiate with such parties for the acquisition of their compensable interests.

d) Advise the property owners, lessees, licensees, occupants, and other holders of compensable interests, as applicable, of the administrative settlement process. Confer with and transmit to TxDOT's ROW Administrator any settlement request from property owners, lessees, licensees, occupants, or other holders of any compensable interest, as applicable, including a detailed

recommendation from DB Contractor in accordance with standards, manuals and procedures as defined in Section 7.2. TxDOT shall determine whether to accept a settlement request. Delivery of the administrative settlement request and DB Contractor's recommendation to TxDOT must occur within 15 Business Days following DB Contractor's receipt of the administrative settlement request.

e) DB Contractor, at its request or the request by TxDOT and/or the TxDOT Administrative Settlement Committee, may participate in the evaluation of the administrative settlement request and attend the committee meeting.

f) DB Contractor shall provide a letter with the TxDOT Administrative Settlement Committee's response to the property owner, lessee, licensee, occupant, or other holder of a compensable interest, as applicable. DB Contractor shall deliver all settlement responses (if within reasonable proximity of the Project) by hand within three (3) Business Days after receipt. If this delivery method is not feasible, DB Contractor shall mail (return receipt requested) response letters not more than three (3) Business Days following any decision by the TxDOT Administrative Settlement Committee. If DB Contractor selects the mailing option, DB Contractor shall make a telephone call to the property owner to discuss the settlement offer prior to mailing the response letter. The TxDOT ROW Administrator, on an as-needed basis, will convene the TxDOT Administrative Settlement Committee.

g) Notwithstanding an unsuccessful completion of the formal administrative settlement process, DB Contractor may engage in ongoing negotiations with the owners of compensable interests. DB Contractor shall develop and incorporate in its ROW Acquisition Plan a procedure for these negotiated settlements. Said negotiations may continue until such time as the Texas Transportation Commission adopts a minute order authorizing the filing of a condemnation petition. DB Contractor shall submit to TxDOT its recommendation of a negotiated settlement and obtain TxDOT's consent prior to acceptance of any settlement.

h) Provide timely (i.e., not more than ten (10) Business Days after inquiry) response to the verbal or written inquiries of any property owner, lessee, licensee, occupant or other holder of a compensable interest, as applicable.

i) Prepare a separate negotiator contact report for each meeting or conversation with any person (or their appointed representative(s) supported by a written confirmation of appointment) who has a compensable interest in each parcel on TxDOT Form ROW-N-94 – Negotiator's Report. Contact reports shall also be prepared for unsuccessful attempts to contact such persons.

j) Maintain a complete parcel file for each parcel. All original documentation related to the purchase of the real property interests will be maintained (housed separately from the relocation files) in conformance with TxDOT standards, manuals, and procedures, as defined in Section 7.2. All original Project ROW documents must be retained and properly secured in DB Contractor's Project office or as otherwise approved by TxDOT. Signed original documents shall be forwarded to TxDOT periodically or as requested by TxDOT with a transmittal form during the acquisition process; provided, however, that all remaining original documents shall be forwarded upon completion of the acquisition of Project ROW for the Project.

k) Prepare and deliver documents of conveyance (including bisection clause and access clause, if applicable) to the property owner, lessee, licensee, occupant, or other holder of any compensable interest, as applicable, and obtain their execution of the same. All signatures on documents to be recorded shall be notarized in accordance with Texas Law.

l) Pursue and obtain Possession and Use Agreements (PUA) concurrently with the parcel negotiations. The form of PUA will be provided by TxDOT and will contain provisions allowing

for construction to commence while negotiations are finalized. Such agreements will be sought and negotiated by DB Contractor strictly in accordance with the Law and only with the prior written consent of TxDOT. If DB Contractor exercises the use of a TxDOT PUA, DB Contractor must obtain a deed or commence action on condemnation proceedings by forwarding a Condemnation Package to TxDOT for approval within six (6) months from the date of the PUA.

m) Be open to all reasonable settlement requests (that comply with the regulations as outlined in this section) from the property owners, which are feasible and help expedite the Project ROW acquisition process. DB Contractor acknowledges and understands that TxDOT encourages all positive and creative solutions which satisfy the property owner and promote the success of the Project.

n) DB Contractor shall prepare and deliver a final offer letter to the property owners, lessees, licensees, occupants, or other holders of any compensable interest, as applicable. The letter shall be on DB Contractor's letterhead and shall be signed by the ROW Acquisition Manager. The final offer letter shall allow a property owner lessee, licensee, occupant or other holder of compensable interest at least 14 Days as the consideration time period to review the final offer. DB Contractor shall submit to TxDOT, a copy of the final offer letter within two (2) days after delivery to the property owner.

If the final offer letter is not accepted, DB Contractor shall follow the procedures established for condemnation.

7.4.2 Relocation Assistance

DB Contractor shall coordinate and perform the administrative requirements necessary to relocate any occupants and personal property from Project ROW and certain remainders, as authorized by TxDOT. All Work prepared by DB Contractor with respect to relocation assistance shall be performed in accordance with applicable Law, including the Uniform Act and TxDOT standards, and in accordance with all provisions of this Agreement.

DB Contractor shall maintain a relocation office (meeting ADA requirements) within reasonable proximity of the Project area as approved by TxDOT. At a minimum, the office hours of the relocation office shall be posted to meet the following timetables:

a) Monday thru Friday: 8:00 am to 5:00 pm

b) Saturday: 9:00 am to 12:00pm

c) Sunday: office may be closed

In addition to the office hours listed above, DB Contractor shall be available to all displacees for relocation services at the convenience of the displacees.

DB Contractor's major activities with respect to the relocation assistance of occupants from Project ROW include:

a) Prepare a Relocation Plan in accordance with the TxDOT *Right of Way Manual*, Volume 3, Chapter 8 (Relocation Program Planning and Construction) within 90 Business Days after receipt of NTP1

b) Monitor relocation assistance activities.

c) Prevent fraud, waste and mismanagement.

d) Assist with all requests and be responsible for carrying out decisions made by TxDOT, the review/appeal process and judicial reviews.

DB Contractor shall provide relocation assistance strictly in accordance with the Law, and, in particular, the Uniform Act and TxDOT standards. With respect to relocation assistance, DB Contractor shall:

a) Provide written notice to all property owners, lessees, licensees, occupants, other holders of compensable interests, and other potential displacees regarding relocation assistance and produce and provide them with a relocation assistance brochure that has been approved by TxDOT. DB Contractor shall perform relocation interviews, complete and maintain interview forms and discuss general eligibility requirements, programs, and services with potential displacees. DB Contractor shall maintain a written record of all verbal contacts.

b) Give written notice of the pending acquisition to any non-eligible occupants. Any questions as to the eligibility of a potential displacee shall be directed in writing to TxDOT's ROW Administrator.

c) Contact and provide relocation assistance to those parties affected by the Project ROW acquisition and complete forms for all displacees, as required.

d) Locate, evaluate and maintain files on comparable available housing, commercial, retail, and industrial sites.

e) Calculate replacement supplement benefits.

f) Compute and submit requests for relocation rental/housing supplement to TxDOT prior to submission to relocatees. All relocation supplements shall be subject to TxDOT's written approval.

g) Perform a Decent, Safe and Sanitary (DSS) inspection for each replacement housing comparable, photograph the comparable and complete the DSS inspection form, TxDOT Form ROW-R116 (Replacement Housing Inspection).

h) Obtain at least two moving estimates from moving companies to effect relocation of personal property or consistent with the Uniform Act.

i) Prepare moving plan with appropriate photos, sketches and inventory of personal property to be moved.

j) Coordinate moves with displacees and moving companies in accordance with TxDOT standards and the Uniform Relocation Act.

k) Maintain relocation contact logs on a TxDOT Form ROW-R96-R (Relocation Advisory Assistance – Parcel Record).

l) Attend all closings on replacement properties, if requested by any party involved, and assure supplemental payments, if any, are properly distributed.

m) Process and compute increased interest payments on the mortgage of owner-occupied dwellings, as required.

n) Deliver to displacees a 90 Day notice of eligibility letter simultaneous with the delivery of the relocation benefits package. Deliver a 90 Day letter to displacees with the location of the comparable property used to compute the supplement.

o) Deliver a 30 Day notice to displacees and property owners upon Possession of Project ROW.

p) Notify TxDOT's ROW Administrator office immediately if a displacee has not moved after 30 Day notice expires. Special effort and consideration should be extended to the displacees in the move out process. If the displacees have not moved from the State owned ROW and eviction is necessary, the DB Contractor must provide written request to TxDOT to begin eviction

proceedings. The request must include written evidence of the due diligence efforts to vacate the displacees. Prepare a written recommendation to facilitate the displacee's move.

q) Be available for any appeals or hearings.

r) Prepare relocation payment claim submissions for all displacees and all relocation assistance benefits.

s) Verify DSS dwelling criteria on all replacement housing as selected by the displacees.

t) Secure dwellings and structures no later than ten Days after vacancy and protect the Project ROW following acquisition and relocation.

u) Maintain a complete file, separate from acquisition files, on each displacee and make available for inspection.

v) Be responsible for all relocation activities that may occur after deposit of the special commissioner's award in the courts, including instances when a parcel referred to the Office of the Attorney General for eminent domain also has a relocation issue. Relocation computations shall be adjusted based on the approved administrative settlement and court award.

w) Prepare all correspondence to the displacees or their representative(s) on DB Contractor's designated relocation letterhead and have DB Contractor's correspondence signed by the Project ROW relocation agent.

x) Deliver to each displacee the relocation assistance payments according to the TxDOT ROW Manual Vol. 3 Relocation Assistance – Chapter 4 Program Administration – Section 1 Procedures – Delivery of Payment.

y) Assist TxDOT and the Office of the Attorney General with eviction proceedings. Serve notice of eviction proceedings to the occupant(s) of the property who have not complied with move dates. Coordinate the eviction process with the local authorities and accompany the Sheriff's Department when the local authorities are carrying out eviction.

7.4.3 Closing Services

For purposes of closing services, DB Contractor shall:

a) Submit a closing Submittal to TxDOT for review a minimum of 24 hours prior to closing. Closing Submittals shall include the following: a.) a reference to the disposition of any environmental matters; b) updated title commitment, no more than 15 Days prior, with notations indicating the disposition of all schedule "B" and "C" items; c) a copy of the executed warranty deed to be delivered; d) a proposed closing statement indicating disposition of all proceeds; e) a copy of any and all releases of liens; f) a copy of any miscellaneous documents and other curative matters required to be delivered at closing and g) a copy of the closing memorandum outlined in item 2 below.

b) Prepare the escrow agreement and closing documents, including a closing memorandum identifying all parties involved in the closing, and listing all documents to be executed and/or delivered in connection with the closing.

c) Attend closings; provide curative documents and exhibits as required and in conjunction with the applicable title company. Confirm that all conditions to closing are satisfied and notify TxDOT of all closing appointments.

d) Obtain an issued title policy based on the approved updated title commitment within 30 Days following closing and transmit the same to TxDOT.

e) Obtain and deliver to TxDOT one (1) certified copy of each instrument of conveyance immediately after closing, and provide the original title policy to TxDOT within five (5) Business Days after receipt. Cause to be delivered to TxDOT the original recorded deed within ten Days after the title company receives the recorded deed.

7.4.4 Condemnation Support

DB Contractor shall provide an individual or individuals having sufficient knowledge of the design of the Project to appear as an expert witness for testimony at the special commissioners' hearing or other proceedings. This individual(s) is also responsible for preparing exhibits as requested by TxDOT or the Office of the Attorney General in support of said testimony.

DB Contractor shall support condemnation efforts as directed by TxDOT and further delineated as follows:

a) Notify TxDOT of any potential condemnation and document the reason(s) for condemnation including recommendations for property closure.

b) Conduct all applicable eminent domain-condemnation activities in accordance with the policies and procedures as described in the TxDOT *Right of Way Manual*, Volume 4: "Eminent Domain "; in the TxDOT *ROW Appraisal and Review Manual*, Chapter 7 "Eminent Domain-State Acquisition" or as revised; and in Chapter 21, Texas Property Code and Senate Bill 18.

c) After non-response or upon receipt of a copy of the rejected final offer from a property owner or other property right holder entitled to compensation, request an updated title report from the title company issuing the original title commitment.

d) Provide to TxDOT, within ten Days following non-response or rejected certified mailing, notification thereof together with a signed and sealed parcel description and parcel plat, and a bisection clause and access clause, if necessary, with the clauses attached to a property exhibit containing the parcel description and parcel plat.

e) Use the information from the title report to join all parties having a property interest on applicable the TxDOT form. Spouses of property holders with compensable rights must also be joined.

f) Upon completion of TxDOT Form ROW-E-49 (Request for Eminent Domain Proceedings), prepare a Condemnation Package containing two copies each of the following documents: the completed TxDOT form, negotiation logs, the updated title report not more than 90 Days old, appraisal receipt acknowledgment, pre-appraisal contact sheet, signed and sealed field notes, parcel sketch, bisection clause and access clause exhibits (if necessary), initial offer letter and final offer letter reflecting latest appraisal, complete minute order request form (form to be provided by TxDOT), any correspondence sent by DB Contractor or from the owner of the compensable interest or representatives, one copy of the appraisal report not more than 180 Days old from the effective date of the appraisal report and evidence of a bona fide offer to the property owner. Submit two (2) complete Condemnation Packages to TxDOT's ROW Administrator for review and approval.

g) Send a copy of the complete petition to the title company and confirm with the title company that the appropriate parties were joined in the case and that no changes in title have occurred since the original litigation guaranty was issued.

h) File the petition for condemnation with the appropriate court clerk after a determination that a timely settlement is not feasible. In counties that require e-filing, the Office of the Attorney General will e-file as appropriate and provide a copy of the petition to TxDOT. DB Contractor shall file the lis pendens with the appropriate county clerk. No later than three (3) Business Days from the date of filing, DB Contractor shall send a copy of the petition and lis pendens, by

certified mail, return receipt requested, to the owner, lessee, licensee, occupant or other holder of compensable interest.

i) Coordinate and provide legal and technical support to TxDOT, as required to facilitate filing the petition, assignment of a court, and setting of a hearing date.

j) Make available to TxDOT on behalf of the Attorney General's office an agent who will be expected to assist in making arrangements for conferences with witnesses prior to trial, filing the condemnation petition, informing all parties as to the filing date of the petition and the case number assigned to the suit, and perform any other duties which will assist in the successful prosecution of the suit, including his or her attendance in court and filing necessary documents to complete all eminent domain proceedings.

k) Depending on the market conditions or if over six months have elapsed since the date of the initial offer, contact the attorney handling the case for TxDOT and confer about the advisability of preparing an updated appraisal. If it is determined that an updated or new appraisal is necessary or desirable, obtain such appraisal using the same procedures as described in Section 7.3.5.1 (Appraisal Services) above. DB Contractor must also undertake appraisal review as described in Section 7.3.5.2 (Appraisal Review).

l) Coordinate with TxDOT on behalf of the Attorney General as to land planners and/or other expert witnesses as required by the Attorney General. DB Contractor, at its cost, shall provide the land planner or other expert at the request of TxDOT or the Attorney General. The land planner or other expert report, if required, shall be completed and forwarded to the appraiser before the updated appraisal is completed.

m) Appear or provide for the appearance of expert witness(es) or fact witness(es) when requested by TxDOT or the Attorney General's Office. The appearances may include pre-commissioner's hearing preparations, special commissioner's hearings, and subsequent proceedings including jury trials and related proceedings.

n) Submit the updated appraisal to TxDOT and the attorney handling the case for TxDOT for review and approval, which review and approval shall occur within ten Business Days of receiving the updated appraisal. TxDOT and DB Contractor must approve any revised offer in writing prior to an offer letter being sent. If a revised offer is approved, prepare a final offer letter, make the revised offer to the property owner or other holder of a compensable interest, as applicable, and submit a copy of the final offer letter to TxDOT for written approval.

o) Communicate with TxDOT as to the parcel status on a monthly basis and in the Project progress report or as requested by TxDOT.

p) Serve in person, a "Notice of Hearing" not later than 20 Days before the date of the special commissioners' hearing or other hearings and notice requirements as directed or authorized by the court.

q) Call and send reminders letter two (2) to three (3) weeks in advance of any hearing to the assigned attorney, engineer, technical experts, appraiser, the commissioners, court reporter, and TxDOT's ROW Administrator concerning hearing dates.

r) Upon completion of the hearing, prepare TxDOT Form ROW-E-73 (Data Sheet – Special Commissioner's Hearing) and commissioners' time sheets. DB Contractor shall make payment to all commissioners involved in the hearing and include payment for commissioners as part of general Project ROW services.

s) Coordinate and provide support to TxDOT's counsel and facilitate distribution of copies of award, prepare request for payment, and file notice of deposit. DB Contractor shall coordinate with TxDOT on behalf of the Office of the Attorney General regarding expert witnesses needed to testify on behalf of the State at the special commissioners' hearing and subsequent proceedings including jury trials. At the request of the Office of the Attorney General or TxDOT, DB Contractor shall provide and pay for all necessary expert witnesses including: engineering, land planners, real estate consultants, cost estimators, outdoor advertising sign experts and environmental consultants and DB Contractor shall appear as expert witness or fact witness, as requested. DB Contractor shall also make any Subcontractors available to appear as an expert witness or fact witness, as requested at the special commissioners' hearing or subsequent proceedings up to Final Acceptance of the construction project or through any maintenance agreement periods. The selection of all expert witnesses to be used for jury trials shall be determined by the Attorney General's Office.

t) Schedule and pay for all court reporter services, transcription costs, expert witness fees, exhibits, and exhibit workbooks as directed by TxDOT.

u) Be responsible for coordinating the pre-hearing meeting with TxDOT on behalf of the Attorney General's office and all others required for testimony or exhibit preparation. DB Contractor shall require expert witnesses with all exhibits and documents to be present at a pre-hearing meeting.

v) Timely file and provide proper service of objections if requested by TxDOT after completion of the special commissioner's hearing and promptly provide evidence of filing and copies of all filed documents to TxDOT. Within three (3) days after objections have been filed, DB Contractor, at its cost, shall order transcripts of such hearing.

w) DB Contractor shall provide an individual or individuals having sufficient knowledge of the design of the Project to appear as an expert witness for testimony at the special commissioner's hearing or other proceedings. This individual(s) is also responsible for preparing exhibits as requested by TxDOT or the Office of the Attorney General in support of said testimony. Exhibits shall be left in the custody of TxDOT at the close of the hearing.

7.4.5 Clearance/Demolition of Project ROW

Prior to demolition of any improvements, DB Contractor shall provide to TxDOT, photographs of the property and all improvements, unless the special commissioner's hearing has been completed and objections have not been filed. DB Contractor shall also have photos of personal property and any other items of dispute in and of a quality suitable for presentation as evidence in court. Following acquisition or possession of any parcel of Project ROW, DB Contractor shall:

a) Within ten (10) Days from vacancy of the property and improvements, secure and protect the buildings, improvements and fixtures on the Project ROW until they are disposed of or demolished. DB Contractor shall board-up, mow, fumigate and winterize as required by TxDOT or applicable Law.

b) Coordinate with the owner and occupants to assure the clearance of personal property from the Project ROW, as applicable.

c) Provide for any insect and rodent control and initiate extermination as required to protect the adjacent properties and rid the Project ROW from infestations.

d) Secure Governmental Approvals required for demolition and environmental surveys or tests, and notify TxDOT in writing of all such activities.

e) To the extent required by Section 7.2.11 (DB Contractor Responsibility for Costs), prepare necessary documentation for disposal of improvements, fixtures and buildings in accordance with applicable Laws and submit the same to TxDOT.

f) Provide written notification to TxDOT of any real and/or personal property remaining on the Project ROW after vacated by the occupants and not acquired as part of the acquisition.

g) Terminate all utility service(s) when appropriate.

h) Process all required forms, documents and permit applications in order to proceed with the timely demolition or removal of any and all improvements, buildings and fixtures located within the Project ROW, as applicable.

i) Demolish and/or remove all improvements.

j) Notify TxDOT upon completion of the demolition and clearance of the Project ROW, as applicable.

7.4.6 Payment Schedule

DB Contractor must submit a payment Submittal for any item that is a TxDOT payment responsibility as outlined in Section 7. A payment Submittal shall consist of:

a) Completed payment request forms for each type of payment

b) All required appropriate documents as shown on each payment request form.

c) Form AP-152 (Tax Payer Identification Number).

The State's warrant will be returned to DB Contractor's ROW Acquisition Manager.

7.4.7 Property Fence

In connection with fences, DB Contractor shall comply with the policies and procedures of the TxDOT *Right of Way Manual*, as well as the specifications found in the current TxDOT Standard Specifications. Fencing standards for DB Contractor-provided fencing shall conform to the overall aesthetics requirements found elsewhere in these DBA Documents and referenced standards.

7.4.8 Property Fencing for Public Properties

Where public facilities now exist that are in high risk areas for public use (particularly those containing parks, sport areas, schools or any highly traveled pedestrian areas), DB Contractor shall construct similar like fence as in the preexisting condition or, at a minimum, construct a 6-foot-high chain-link fence with metal posts if no fence was in the preexisting condition. DB Contractor shall use Good Industry Practice in fencing public properties to control public access to the Project.

7.4.9 Property Fencing for Private Properties

DB Contractor shall instruct the appraiser to use the "Cost to Cure" format to compensate an owner of private property for a replacement fence when the Project ROW line leaves one or more unfenced remainder property(ies) that were fenced before the taking. Compensation for the new fencing will be based upon the same type of fence as the property owner's existing fence.

When the property owner is paid through the appraisal process for the cost to rebuild the fence on the remainder property, DB Contractor shall include in the memorandum of agreement or the purchase agreement for such property the following clause:

"It is further understood and agreed that the Grantor has been compensated for the construction of a new fence and shall be responsible for constructing the necessary fencing within 30 Days from the date of closing. Grantor specifically understands and agrees that the fences are the property of the Grantor and

they shall be liable and responsible for any reconstruction, maintenance, or adjustment with regard to such fencing."

DB Contractor shall make reasonable and good faith efforts to ensure that the property owners, who have been compensated for fencing of the remainder properties, erect the fence in accordance with the construction schedule.

If necessary to maintain the Project construction schedule and to control unauthorized access to the Project ROW by the public or livestock, DB Contractor shall be responsible for providing temporary fencing in cases where the property owner refuses to fence the property within the allotted timeframe.

After the property owner's retention period has expired and if any existing fencing remains, DB Contractor shall remove the existing fences from the newly acquired Project ROW and will be responsible for all costs associated therewith.

7.5 Early ROW Acquisition

TxDOT shall notify DB Contractor if certain Project ROW parcels are scheduled to be acquired by TxDOT or Governmental Entities prior to issuance of the NTP2. DB Contractor will be updated regularly on the status of the acquisition process for each parcel, if any.

After NTP2, DB Contractor shall complete the acquisition process and coordinate the scheduling of any remaining early Project ROW acquisitions.

8 GEOTECHNICAL

8.1 General Requirements

DB Contractor shall perform all geotechnical investigations, testing, research, and analysis necessary to effectively determine and understand the existing surface and subsurface geotechnical conditions of the Project ROW to be used by DB Contractor to carry out the Work.

DB Contractor shall ensure the geotechnical investigations and analyses are thorough and complete in order to provide accurate information for the design of roadways, pavements, foundations, retaining walls, structures, and other facilities to ensure a safe and reliable Project that meets the requirements of the DBA Documents.

All geotechnical work shall be performed in accordance with the current versions of the TxDOT *Geotechnical Manual*, TxDOT Pavement Design Guide and latest AASHTO and FHWA publications. In the event of a conflict among these standards related to geotechnical engineering or pavement design, TxDOT standards shall take precedence.

8.2 Design Requirements

8.2.1 Subsurface Geotechnical Investigation by DB Contractor

DB Contractor shall determine the scope of final geotechnical investigations for the Project using the guidelines provided in TxDOT Geotechnical Manual and FHWA publications. The final geotechnical exploration may include soil borings, test pits, rock coring, and pavement coring. DB Contractor shall determine the specific locations, frequency, and scope of all subsurface geotechnical investigations, testing, research, and analysis necessary to design a safe and reliable roadway, pavement, foundation, structure, embankment, excavation, slope, and other facilities for the Project in accordance with the TxDOT and FHWA geotechnical requirements.

DB Contractor shall utilize drilling and field investigation measures that safeguard groundwater from contamination, and shall be responsible for any mitigation or restoration associated with the geotechnical investigation work.

Visual pavement surveys, and other field testing including Falling Weight Deflectometer (FWD) testing shall also be performed as deemed necessary for new pavements and existing pavement rehabilitation designs.

DB Contractor shall prepare and amend, as needed, its Geotechnical Engineering Reports documenting the assumptions, conditions, and results of the geotechnical investigation and analyses, including the following:

a. The geology of the Project area, including soil and/or rock classifications, and drainage characteristics;
b. Field investigations and laboratory test results used to characterize conditions. Field investigations shall include descriptions of the soil/rock, Texas Cone Penetration test results, and Rock-Quality Designation (RQD) for rock. The scope of laboratory testing shall be determined by the DB Contractor and shall include, but not limited to, moisture content, plasticity index, gradations for each major soil strata change, levels of shrink/swell potential, levels of sulfate (on-site and borrow), soil compressibility, and short-term and long-term shear strength tests and properties;

c. A discussion of conditions and results with reference to specific locations on the Project;

d. Design recommendations and construction parameters resulting from the geotechnical investigation and analysis, including parameters for the design of pavements, retaining walls, pipes, structures, slopes, and embankments in accordance with TxDOT and FHWA geotechnical requirements;

e. Slope stability analyses for proposed embankment, excavation and retaining wall slopes including both short-term (undrained) and long-term (drained) conditions, and discussion of design measures undertaken to ensure stability and safety of all slopes. The design minimum factor of safety required for global stability of all slopes and walls shall be in accordance with the TxDOT *Geotechnical Manual*. The analysis shall consider the potential for long-term surficial slide failures common to high plasticity clays in Texas, and specific recommendations shall be provided to minimize their occurrence;

f. Quantitative settlement analyses that consider both total and differential settlements. Analyses shall consider compressibility of the proposed fill and the underlying soil and rock and shall estimate settlements associated with the loads from the fill and the proposed structures. These evaluations should include immediate compression, primary consolidation, secondary compression, hydro-compression, expansion, and any other pertinent characteristics.

g. Plan view locations of field sampling, boring logs and other field data, laboratory test results, calculations, and analyses that support design decisions;

h. Texas Triaxial Class (TTC) for subgrade and borrow; and

i. Thicknesses for the SH 360 existing pavement to remain in place.

The geotechnical engineering reports shall:

a. Ensure that adequate investigation, testing, analysis, design, mitigative measures, and construction planning are applied to assess and provide for the effects of swell pressures from expansive soil and rock materials on foundations and earth retaining structures. They shall address all design features and facility characteristics that could affect expansive soil behavior;

b. Provide design calculations, construction parameters and construction recommendations derived from geotechnical investigations for the design of structure foundations, pipes, pavements, slopes, embankments, and earth retaining structures;

c. Assess the corrosion potential of the soil and rock materials and conditions that will be encountered, and the impacts to planned walls, pavement, foundations, surface, and subsurface facilities; and

d. Include layout of boring locations along corridor.

Each Geotechnical Engineering Report, upon completion and including any later supplements or amendments, shall be submitted to TxDOT for review and comment.

DB Contractor shall submit final Geotechnical Engineering Reports, signed and sealed by a Registered Professional Engineer, to TxDOT for approval with the Released for Construction Documents.

8.2.2 Pavement Design

The TxDOT Pavement Design Guide, with its latest revisions, shall be the basis for all pavement designs for the Project, and is supplemented with the requirements contained within this document as identified in the paragraphs in this section. Where there are conflicts between the requirements in these two documents, the requirements in this document shall take precedence.

DB Contractor shall include the proposed permanent pavement designs for the Project in the Proposal and shall indicate the applicable roadway and station limits for each pavement design. DB Contractor shall

provide in the Proposal a tabulation of the design k-values, FWD data, resilient modulus, or other basis for the pavement thickness designs, and including station limits.

After DB Contractor has completed its pavement investigations and analyses, DB Contractor shall provide verification of the Proposal pavement designs and submit for TxDOT review.

The pavement designs developed by DB Contractor shall be signed and sealed by a Professional Engineer Registered in the State of Texas.

Pavement widenings shall be of the same pavement type as the existing adjacent sections. An alternate pavement design can be proposed pending TxDOT approval to address constructability issues in areas of narrow widening.

The number of ESALs and/or the traffic volumes to be used in the pavement designs shall be those provided in Attachment 8-1 (ESAL Counts) including the lane distribution factors provided in Table 8-1.

Table 8-1: Lane Distribution Factors

Total Number of Lanes in One Direction	Lane Distribution Factor
One or two lanes	1.0
Three lanes	0.7
Four or more lanes	0.6

DB Contractor should expect that subgrade materials will vary throughout the Project limits. DB Contractor shall perform testing to validate the subgrade modulus values used for flexible pavement designs and the Effective Modulus of Subgrade Reaction values used for rigid pavement designs. If the site subgrade materials have a lower value than used for the Proposal-phase pavement designs, DB Contractor shall submit an adjusted pavement design for review and acceptance by TxDOT.

Pavement design report(s) shall document the assumptions, considerations, and decisions contributing to DB Contractor's pavement designs, including the following:

a. Pavement design details by location, including structural layer material types, general specifications, and thicknesses;

b. Life-cycle cost analysis, including future maintenance, resurfacing, and other rehabilitation measures, and what these activities are likely to entail;

c. Relevant existing pavement evaluation data (structural and functional) and condition information on adjacent roads;

d. Site conditions which might influence the design and performance of pavements;

e. Relevant geotechnical data and drainage requirements including boring logs, laboratory soil test results, and active or passive drainage system design;

f. Parameters used in the pavement design(s), including traffic loads, pavement material characterization, environmental conditions, and pavement design life;

g. Other considerations used in developing the pavement design(s), including subgrade preparations and stabilization procedures. Material selection justification shall also be provided;

h. Pavement design calculations; and

i. Layout of pavement boring/core locations.

DB Contractor shall prepare separate pavement designs for the following:

a. New pavement which includes all new pavement sections constructed for the Project and pavements constructed for widening of existing or rehabilitated pavement sections.

b. Temporary pavement or "throw-away" pavement required to construct the permanent pavement for the Project which shall be designed in accordance with the requirements contained in Section 8.2.2.3.3 of the Technical Provisions

c. Rehabilitated pavement which includes the portions of existing frontage road pavement that will be retained but will require resurfacing, restoration or rehabilitation. DB Contractor is responsible for evaluating the existing pavement including subgrade conditions and determining what rehabilitation strategies would be required to ensure the rehabilitated pavement meets the minimum design and performance requirements in the Technical Provisions. Rehabilitation of existing pavement shall have a minimum of additional twenty (20) years life. However, the rehabilitation of portions of existing pavement requiring full-depth reconstruction equal to or exceeding approximately 500 feet in length and which require a pavement design report shall have a minimum additional thirty (30) years life. Evaluation of pavement subgrade conditions and proper subgrade treatment shall be addressed as part of the pavement rehabilitation design process. At Substantial Completion, rehabilitated pavement shall meet the performance requirements contained in Section 19.1.7 of the Technical Provisions.

DB Contractor shall submit final pavement designs to TxDOT for approval with the Release for Construction Documents. The following shall be submitted:

a. Pavement Design Reports including any later supplements or amendments. The reports shall include results of the field explorations and testing of pavement sections as well as recommended pavement rehabilitation methods and designs for new pavements;

b. Verification of Proposal phase pavement thickness designs;

c. Verification plan for effective modulus of subgrade reaction (FWD and Texas Triaxial Class (TTC) for rigid pavement) and/or resilient modulus (for flexible pavement); and

d. Material selection justification from surface to subgrade.

8.2.2.1 Methodology Enhancements

Recognizing that the development of pavement design methods, products, and procedures are under continuous enhancement within the pavement community, DB Contractor and TxDOT understand that new methods, procedures, and products may present opportunities for improved pavement design and management during the Term of the DBA. Both parties mutually agree to consider the use of new design technologies provided that any such technologies and methods are agreed to by DB Contractor and approved by TxDOT in writing prior to final implementation.

8.2.2.2 Related Pavement Materials Specifications

Unless otherwise specified herein, pavement material requirements are defined in the most current version of the TxDOT Standard Specifications and per special provisions as provided within these DBA Documents. Test procedures identified herein shall be the most current version identified in the Materials Test Procedures, AASHTO or ASTM standards or equivalent guidance as approved or provided by TxDOT.

8.2.2.3 Pavement Type

The following requirements shall be incorporated into the final pavement selection and design:

Both flexible and rigid pavements are allowed.

For rigid pavement type selection, only Continuously Reinforced Concrete Pavement (CRCP) pavement is permitted.

For flexible pavement selection, perpetual pavement design is required for mainlanes, frontage roads and cross streets within the Project ROW. Pavement design(s) shall be prepared for full-section depth construction in accordance with TxDOT Pavement Design Guide. Staged pavement construction is not permitted. Staged pavement construction does not include resurfacing.

Pavement for the shoulders of all roadways shall be the same section (materials and depths) as the adjacent roadway pavement.

Ramp pavements shall be constructed with the same section (materials and depths) as the adjacent mainlane pavement.

Final design details for the paving at the Toll Zones shall be submitted to TxDOT for acceptance. Special paving at the Toll Zones shall be CRCP.

For widening of existing pavement sections, DB Contractor shall provide documentation of criteria and rationale for the construction approaches selected to widen sections. DB Contractor shall comply with TxDOT Pavement Design Guide, historical performance, and Fort Worth District guidelines when designing the widened sections and selecting construction approaches. Construction joints along the existing and new pavement sections shall be placed a minimum of four (4) inches from the wheel path to improve performance. Geotextiles or stress absorbing membrane interlayer (SAMI) shall be placed over the widening joint to delay reflective cracking prior to performing asphalt overlays only.

For all widened sections, the interface between the new widened pavement and the existing pavement shall provide a uniform surface of the same material type across all adjacent lanes. In areas where an existing asphalt surface is in place and widening is required, a new surface course overlay will be required over the existing and widened pavements.

8.2.2.3.1 Rigid Pavement Requirements

Design Specification. Rigid pavement shall be designed in accordance with the TxDOT's *Pavement Design Guide* using the following design inputs:

Table 8-2: Rigid Pavement Design Inputs

28 day Concrete Modulus of Rupture, psi	620
28 day Concrete Elastic Modulus, psi	5,000,000
Effective Modulus of Subbase/Subgrade Reaction, psi/inch	300 max.
Serviceability Indices ▪ Initial Serviceability Index ▪ Terminal Serviceability Index	 4.5 2.5
Load Transfer Coefficient	*
Drainage Coefficient	**
Overall Standard Deviation	0.39

Reliability %	90 (≤ 5 million ESALs) 95 (> 5 million ESALs)
Design Traffic, 18 Kip Equivalent Single Axle Load (ESAL)	Determined by DB Contractor. See Attachment 8-1 for TxDOT Transportation Planning and Programming (TPP) data.
* Table 8-1, *TxDOT Pavement Design Guide* ** Table 8-2, *TxDOT Pavement Design Guide*	

Effective Modulus of Subgrade Reaction. The effective modulus of subgrade reaction (k in psi/in) is to be used for design and the value to be achieved at all times during construction activities.

Potential Vertical Rise (PVR). DB Contractor shall design the overall new subgrade and new pavement structure to have a PVR no greater than 1.5 inch as calculated in accordance with TEX-124-E from soil tests in a soil column 15 feet deep as measured from the proposed finished pavement grade. Alternatively, provide materials that result in an Effective Plasticity Index (PI) of less than 25 when calculated to a depth of 8 feet from finished pavement surface for mainlane pavements, and to a depth of 7 feet from finished pavement surface for non-mainlane pavements. Calculation and sampling requirements for determination of Effective PI are stated in Section 8.3.1 of the Technical Provisions.

Performance Life Requirements. A design life of thirty (30) years shall be used for the mainlanes, ramps, frontage roads, Toll Zones and cross streets.

Continuously Reinforced Concrete Pavement (CRCP). Continuously Reinforced Concrete Pavement will require transverse tining. The current TxDOT standards shall be utilized. Including, but not limited to:

CRCP(1)-13 "Continuously Reinforced Concrete Pavement, One Layer Steel Bar Placement".

CRCP(2)-13 “Continuously Reinforced Concrete Pavement, Two Layer Steel Bar Placement”.

Longitudinal and transverse pavement joints shall not conflict with loops of the automatic vehicle detection and classification technology detection systems.

8.2.2.3.2 Flexible Pavement Requirements

Design Methodology. For flexible pavement design, DB Contractor shall use the TxDOT online *Pavement Design Guide*. The pavement designs shall utilize the TxDOT FPS 21 procedure. All pavement thickness designs shall be checked using the Modified Texas Triaxial Class design method, and other analyses techniques necessary to prevent premature failure from rutting and fatigue.

Performance Life Requirements. A design life of thirty (30) years shall be used for the mainlanes, ramps, frontage roads, Toll Zones and cross streets.

Potential Vertical Rise. DB Contractor shall design the overall new subgrade and new pavement structure to have a PVR no greater than 1.5 inch for mainlane and 1.5 inches for non-mainlane pavements as

calculated in accordance with Tex-124-E from soil tests in a soil column 15 feet deep as measured from the proposed finished pavement. Alternatively, provide materials that result in an Effective Plasticity Index of less than 25 when calculated to a depth of 8 feet from finished pavement surface for mainlane and to a depth of 7 feet from finished pavement surface for non-mainlane pavements. Calculation and sampling requirements for determination of Effective PI are stated in Section 8.3.1 *Pavement Material Requirements*.

Design Modulus. The DB Contractor shall establish the design modulus using laboratory resilient modulus tests conducted on representative samples of the soils supporting the pavement structures. This design modulus shall be used for the FPS 21 design procedure, and shall not exceed the Effective Resilient Modulus as described below. Design moduli shall be determined for other pavement layers where the maximum value does not exceed values established from methods and criteria stated below. Design moduli determined from methods identified are irrespective of the pavement design method used, where the material is placed in the pavement structure, and depth of the layer. When it is in the interest of TxDOT to use alternative methods for determining material moduli proposed by the DB Contractor, justification and documentation shall be provided to demonstrate that an equivalent pavement structure will be provided.

a) ***Effective Resilient Modulus, (MR).*** Effective Resilient Modulus testing is only applicable to subgrade materials; that is, natural subgrade or materials imported as embankment and are not stabilized. Determine the MR using the AASHTO laboratory test method T307 for subgrade soil samples over the Project, or segments of the Project, with an adjustment of test results for seasonal variations, per AASHTO *Guide for the Design of Pavement Structures, 1993*. Only load sequence number 7 of 15 (4 psi confining pressure, 4 psi maximum axial stress for Type 2 materials; 10 psi confining pressure, 10 psi maximum axial stress for Type 1 materials) will be used to determine the test result.

   Where multiple layers of material are present, MR shall be determined for the predominant soil within three feet in depth from the finished pavement subgrade elevation. Where rock is the predominant subgrade and MR determination is not practical, a maximum MR of 25,000 psi may be assumed.

   Run tests on samples at optimum moisture content (OMC), 2% dry of OMC, and 2% wet of OMC. Optimum moisture content shall be determined by the appropriate TxDOT compaction procedure; molding shall be governed by the appropriate method for the material tested as identified in AASHTO T307.

   Distribute MR values as shown in Table 8-3 for the region in which the DB Contractor will be constructing the Project. Determine which distribution to apply by selecting the rainfall range appropriate for the Project location from Figure 8-1.

Table 8-3: Regional Distribution of Months Used to Determine Effective Resilient Modulus

Region	Annual Rainfall Range	Moisture Content Weighting in Months		
		- 2% OMC	@ OMC	+ 2% OMC

1	0 – 12	6	4	2
2	12 – 24	4	4	4
3	24 – 36	2	5	5
4	36 – 48	2	4	6
5	48 – 56	0	3	9

b) ***Unbound Base and Subbase.*** Only material meeting the definition of Unbound Base in Section 8.3.1 will be considered; all other unbound materials used as a pavement layer that do not meet this definition shall be considered subgrade/embankment. For materials meeting the requirements of Item 247, TxDOT Standard Specifications, the design modulus shall not exceed three times the Effective Resilient Modulus for the subgrade, and shall not exceed 75,000 psi.

c) ***Stabilized Base***. Stabilized base materials shall meet the requirements of Stabilized Base in Section 8.3.1, or shall be considered a subgrade or subbase material that may require stabilization. The design moduli of stabilized base materials shall be established by the greater of: (a.) the ratio of stress to strain in a near-linear portion of the loading curve during UCS testing, or (b.) ten times the Effective Resilient Modulus for subgrade. The selected value shall not exceed the maximum modulus value shown in Table 8-4 for stabilized base moduli.

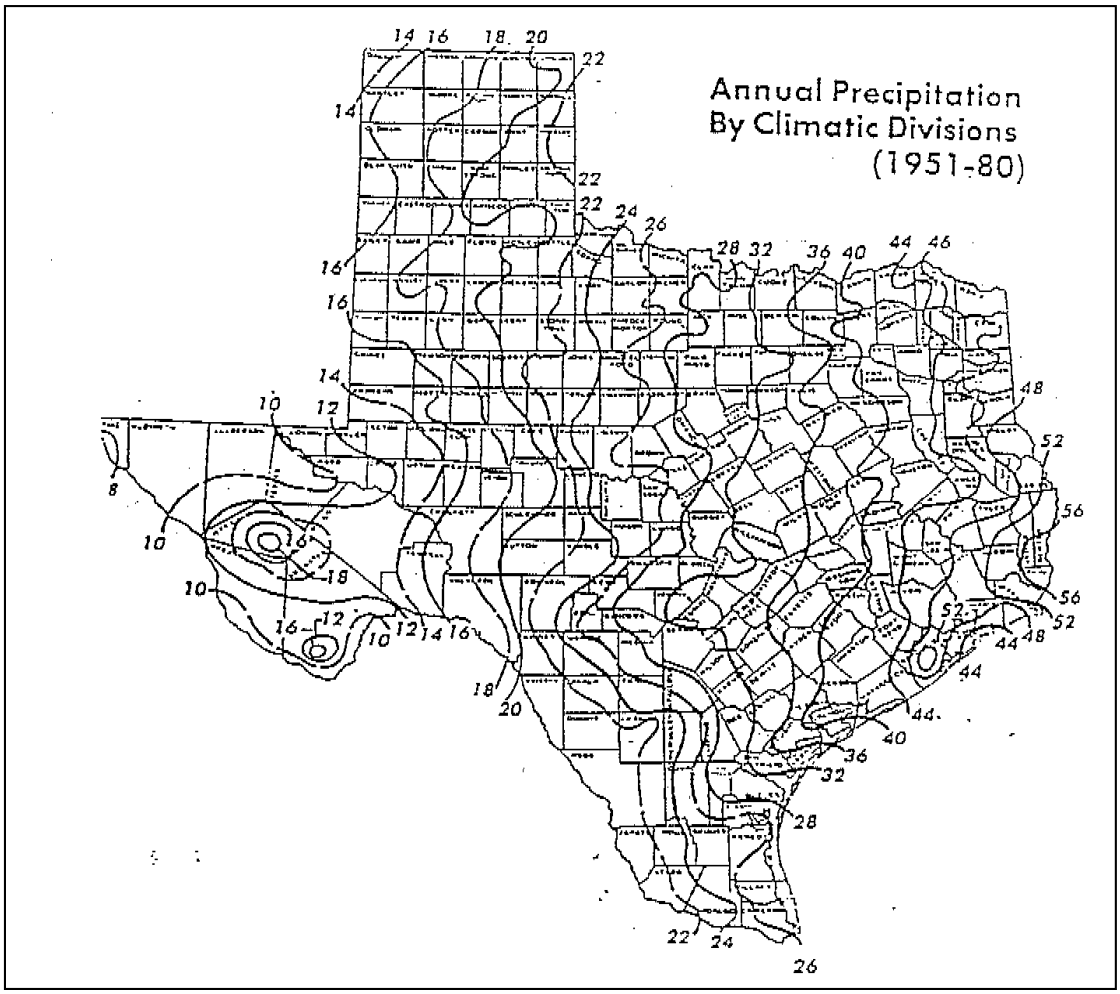

Figure 8-1: Rainfall Graph for Determining Regional Soil Testing Requirements

d) ***Stabilized Subbase and Stabilized Subgrade.*** Materials shall meet the requirements of Subbases in Section 8.3.1 or the material shall be regarded as subgrade material and may be subject to MR measurements. Stabilized subgrade and stabilized Subbases may be incorporated as a structural layer and shall have a design modulus equal to the greater of: (a.) the ratio of stress to strain in a near linear portion of the loading curve during UCS testing, or (b.) two times the value of the Effective Resilient Modulus of the unstabilized subgrade. The selected modulus value shall not exceed the values shown in Table 8-4.

e) ***Design Structural Values.*** Table 8-4 provides maximum modulus design values to be used for pavement design. For materials not listed, provide documented testing establishing the design value appropriate for the design procedure being used.

Table 8-4: Design Structural Values for HMA Asphalt Pavements

Material Type	TxDOT Standard Specifications	Maximum Modulus for FPS 21
New Dense-Graded Hot Mix Asphalt	Item 341 (for permanent pavement)	Combined HMA thickness: ≤8" use 500ksi > 8.0" use 650ksi
Permeable Friction Course	Item 342	300 ksi
Performance Design Mixtures	Item 344	Combined HMA thickness: ≤ 6.0" use 650ksi 6"<T≤8" use 700ksi > 8.0" use 850ksi RBL: 350ksi
Stone-Matrix Asphalt	Item 346	Same as Item 344
Unbound Base	Item 247, Grade 1	*75ksi
Stabilized Base ▪ Cement ▪ Asphalt	 Items 275 and 276 Item 292	 *200ksi 350 ksi
Stabilized Subgrade or Sub-base ▪ Hydrated Lime ▪ Cement	 Item 260 Item 275	 *30ksi *30ksi

* Maximum design values.

Poisson's Ratio. The Poisson's ratios for this Project shall meet the requirements of TxDOT Pavement Design Guide.

Truck Volumes. Determined by DB Contractor. See Attachment 8-1 for TxDOT Transportation Planning and Programming (TPP) data.

Initial ADT and projected ADT. Determined by DB Contractor. See Attachment 8-1 for TxDOT Transportation Planning and Programming (TPP) data.

Serviceability Indices. The serviceability indices for this Project shall meet the requirements of TxDOT Pavement Design Guide.

Terminal (Minimum Acceptable) Serviceability Index. The terminal serviceability index for this Project shall be 3.0 (mainlanes and frontage roads). A serviceability index of 2.5 may be used if the HMAC thickness is greater than or equal to 8.5 inches.

Design Reliability or Confidence Level. The reliability factor shall be 95% for ESALs > 5 million and 90% for ESALs ≤ 5 million.

Overall Standard Deviation (AASHTO design only). Use 0.49.

8.2.2.3.3 Flexible Pavement Requirements for Temporary Pavements

Design Methodology. For flexible pavement design of temporary pavements, DB Contractor shall use the TxDOT online *Pavement Design Guide*. The pavement designs shall utilize either the TxDOT FPS 21 procedure or the 1993 *AASHTO Guide for the Design of Pavement Structures* and the latest version of the DARWin computer program, approved by AASHTO. All pavement thickness designs shall be checked using the Modified Texas Triaxial Class design method, and other analyses techniques necessary to prevent premature failure from rutting and fatigue.

DB Contractor shall prepare and submit for TxDOT review separate pavement designs for temporary pavement construction areas using TxDOT Standard Specification Item 340.

Table 8-5: Design Structural Values for Temporary Pavement

Material Type	TxDOT Standard Specifications	Maximum Modulus for FPS 21	AASHTO layer coefficient (max.)
New Dense-Graded Hot Mix Asphalt	Item 340	Combined HMA thickness:	
		≤8" use 500ksi	0.44
		> 8.0" use 650ksi	0.45

8.2.3 Rehabilitation of Existing Pavements

Pavement rehabilitation includes the resurfacing and restoration work undertaken to restore serviceability, to extend the service life of existing pavements, if the existing SH 360 pavement does not meet the performance requirements stated in Section 19.1.7 of these Technical Provisions. This can include partial recycling of the existing pavement, placement of additional surface materials, or other work necessary to return the existing pavements to a condition of structural or functional adequacy in accordance with Section 19.1.7 by Substantial Completion of the Project.

DB Contractor shall prepare and submit a pavement rehabilitation plan after evaluating the existing pavements to determine the adequacy of past performance, determine failure mechanisms, and determine the extent of rehabilitative effort necessary. The structural and functional characteristics shall be evaluated by nondestructive and/or destructive tests and surveys as outlined in *TxDOT's Pavement Design Guide*. Based on the pavement evaluation, DB Contractor shall select and submit to TxDOT for approval the rehabilitation plan to achieve the performance requirements stated in Section 19.1.7. The plan should take into consideration cost, existing problems, and prevention of future problems. Rehabilitation shall provide pavements that are structurally adequate to support the anticipated traffic for the design periods defined in Section 8.2.2.

8.2.3.1 Rigid Pavement Rehabilitation

Acceptable rigid pavement rehabilitation methods are provided in *TXDOT Pavement Design Guide.* Rigid pavements full depth repair (FDR) may be used if the rehabilitated area is at least six (6) feet long and at least half a full lane width. The limits of the FDR rehabilitation can be determined by visual inspection as part of the pavement survey. Only diamond-bladed concrete saw-cuts can be used to saw-cut the pavement sections. The saw-cut operations shall be adjusted so that the subsequent repair operations can immediately follow. DB Contractor shall make sure to clean out and fill in the drilled hole completely

with epoxy before inserting the rebar in the hole per TxDOT Standard Specification, Item 361. DB Contractor shall not use hammerdrills to drill the holes into the existing concrete. Concrete used to rehabilitate rigid pavements shall conform to Items 360, 361, and 421 of TxDOT Standard Specifications with a maximum water-cement ratio of 0.45. Concrete strength shall be estimated using TxDOT Tex-426-A test (Estimating Concrete Strength by the Maturity Method).
Partial pavement depth repair (PDR) shall be limited to shallow spallings with depths less than four inches.

8.3 Construction Requirements

8.3.1 Pavement Materials Requirements

DB Contractor shall incorporate the following requirements into the preparation of the initial pavement designs for the Proposal and the subsequent final pavement designs, plans, quality control and quality assurance programs, and the field construction procedures. Subject to approval by TxDOT, alternate material specifications and construction requirements may be proposed by DB Contractor provided the objectives of the Project are met and an equivalent pavement structure is provided.

Subgrade Material Composition. DB Contractor shall analyze subgrade material composition, design the pavement structure, and perform necessary construction procedures to eliminate soluble sulfate induced heave. When soluble sulfates may present a potential for a reaction detrimental to the pavement structure, DB Contractor shall submit alternate designs and/or construction procedures for TxDOT approval.

When quantities of soluble sulfates detected are greater than 500 ppm, DB Contractor shall determine the source of the sulfate and whether there are greater concentrations existing or that would be created when pulverized in and surrounding the sampled location. DB Contractor shall use the TxDOT *Guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures* to assist with testing and detection and construction practices. No soil shall have additives introduced to such material that would cause a detrimental reaction to the pavement structure or its ride quality as measured by the International Roughness Index (IRI).

Effective Plasticity Index (PI). The same method of determining Effective PI shall be used for both design and verification of design. DB Contractor shall determine the Effective PI for unstabilized subgrade to the depth specified below finished pavement surface. The Effective PI shall be determined, using Tex-106-E, via a process that proportionately accounts for the plasticity contribution of the soil binder (material passing the #40 sieve) for each individual one foot layer, or portion thereof, to the depth specified . The Effective PI is ultimately a weighted average of the Plasticity Indices of the material in the soil column analyzed. For example, the sum of all PI measurements representative of each one foot deep sample tested divided by the total depth designated by the pavement type. DB Contractor shall use soil to the depth of 8 feet for the mainlane pavements and 7 feet for other pavements for calculation of Effective PI. Concrete, hot mix asphaltic concrete, stabilized base courses, granular base, and stabilized subgrade/embankment are considered to be non-swelling with no PI. Stabilized materials shall meet material requirements stated herein.

Unbound Base. Provide the appropriate unbound base as recommended in the TxDOT *Pavement Design Guide*. A minimum placement thickness of 6 inches is required.

Swell pressure testing may be used to supplement the approach described above.

Stabilized Base. Stabilized base may either be modified with chemical additives or asphaltic binders. Materials to be stabilized shall meet the requirements of either Grade 1, Grade 2, or Grade 5 base as defined by Item 247 of the TxDOT Standard Specifications or appropriate special provisions, and shall have a minimum thickness of 6 inches. Asphalt stabilized base material shall meet the requirements of Item 292 of the TxDOT Standard Specifications. Item 292 may only be used in lieu of subbases,

stabilized base, or unbound base. When chemical additives are used to stabilize base, Table 8-6 (Minimum and Maximum Retained Unconfined Compressive Strength Values to be Achieved when using Chemical Additives for Stabilization, by Pavement Type) will be used to determine the stabilizer content. Stabilized base shall be designed to achieve the unconfined compressive strength shown in Table 8-6 (Minimum and Maximum Retained Unconfined Compressive Strength Values to be Achieved when using Chemical Additives for Stabilization, by Pavement Type) immediately following a ten (10) day capillary moisture conditioning. Moisture conditioning shall be conducted in a similar method as that used in TEX-121-E.

Table 8-6: Minimum and Maximum Retained Unconfined Compressive Strength (UCS) Values to be Achieved when using Chemical Additives for Stabilization, by Pavement Type.

Pavement Type	Minimum UCS (psi)	Maximum UCS (psi)
Flexible Pavement	300	500
Rigid Pavement	500	750

Subbases.

a. ***Granular Materials***. Materials classified by the Unified Soil Classification System as any of the following: GP, GM, SW, SP, SM, SC, or ML, shall be stabilized if present within 30 inches of the finished pavement surface. The aforementioned materials may be used as a subbase and included as a structural layer when stabilized and meet the requirements of stabilized subbase as defined herein. These materials shall be stabilized, when required, to achieve a minimum layer thickness of 6 inches. Untreated granular base meeting the requirements of Item 247, Grade 1 or 2 may be used without restriction;

b. ***Stabilized Subbase.*** Materials not included in Granular Materials above, do not meet the requirements of Item 247, TxDOT Standard Specifications, or materials that have a Plasticity Index (PI) value less than twenty-five (25), may be stabilized and used as a structural layer. For structural layers, provide a minimum 8-inch thickness of compacted material. Stabilized subbase materials shall be designed to achieve not less than 100 psi unconfined compressive strength immediately following a ten (10) Day capillary moisture conditioning. Moisture conditioning shall be conducted in a similar method as that used in TEX-121-E. These materials shall be designed as defined in test methods used for the selected additive. Follow the TxDOT's *Pavement Design Guide* stabilization guidelines; and

c. ***Stabilized Subgrade.*** If subgrade stabilization is used for purposes of providing a working platform, then no structural benefits can be claimed and the stabilized subgrade shall not be included in the pavement design. For structural layers, provide a minimum 8-inch thickness of compacted material. If a structural layer is required, design and mold subgrade material with the desired additive using the TxDOT test method appropriate for the additive incorporated. The design shall achieve not less than 100 psi unconfined compressive strength immediately following a ten (10) day capillary moisture conditioning conducted in a method similar to that used in TEX-121-E. Follow the TxDOT's *Pavement Design Guide* stabilization guidelines.

Underseal. DB Contractor shall place a one (1) course surface treatment as an underseal directly on top of any untreated or treated base layer and/or prior to all hot mix asphalt overlays.

Surface Course Thickness. The surface course for all pavements utilizing flexible pavement design shall be a minimum of 2 inches of asphaltic concrete pavement.

Surface Mix Type. Where flexible pavement structures are selected, the surface mix for mainlanes and ramps shall be Stone Matrix Asphalt (SMA) meeting the requirements of Item. The final surface mix for frontage roads and cross roads shall be Stone Matrix Asphalt (SMA) meeting the requirements of Item 346 when the combined HMA thickness is greater than 6.0 inches, or a regular dense-graded mix Type C or Type D meeting the requirements of Item 341 when the combined HMA thickness used is less than 6.0 inches.

8.3.2 Construction Verification

General. The independent Construction Quality Acceptance Firm (CQAF) shall perform DB Contractor's quality acceptance. The construction verification tasks described below are part of the CQAF quality acceptance efforts.

When performing construction activities under or adjacent to existing structures or Utilities, DB Contractor shall limit vertical settlements and ground deformations so as to not damage structures, including foundation Elements, and/or Utilities. For those occurrences involving third party structures and Utilities, DB Contractor shall coordinate excavation activities with Section 5 (Third Party Agreements) and 6 (Utility Adjustments). For those occurrences involving TxDOT and the Authority's structures and Utilities, DB Contractor shall coordinate excavation activities with TxDOT and the Authority.

Effective Modulus of Subgrade Reaction for Rigid Pavement Designs. DB Contractor shall verify that the design effective modulus of subgrade reaction has been achieved through the field construction activities. This verification process shall include field sampling and testing activities designed to provide confirmation of the design effective modulus of subgrade reaction. This verification process shall be described in a plan that includes, but is not limited to, the verification methodology, example calculations, reference documents, and frequency of field sampling and testing. DB Contractor shall submit this verification plan to TxDOT for review and comment.

Effective Resilient Modulus, (MR) for Flexible Pavement Designs. DB Contractor shall provide subgrade modulus testing in accordance with AASHTO T307. DB Contractor shall retrieve a randomly selected verification sample at a minimum rate of one sample (three replicates per sample) for each 2500 linear feet of roadbed; where the roadbed has a dimensioned width greater than 100 feet, one additional sample shall be collected and tested. Frontage and other access roads shall be sampled and tested independently if more than 100 feet separates the roadbeds or are not parallel to the mainlane alignment. Additional samples shall also be taken at each location where a significant and recognizable change in subgrade material (a change in USCS classification) is encountered during grading operations.

Where multiple layers of material are present, MR shall be determined for the representative soil within three feet in depth from the finished pavement subgrade elevation. Where rock is the predominant subgrade and MR determination is not practical, a maximum MR of 25,000 psi may be assumed.

Regardless of the position of the layer or material sampled and tested, DB Contractor shall use only the AASHTO T307 load sequence number 7 of 15 for verification testing (4 psi confining pressure, 4 psi maximum axial stress for Type 2 materials; 10 psi confining pressure, 10 psi maximum axial stress for Type 1 materials). The MR results from this testing shall be compared to the Effective MR selected for use in designing the pavement structure, to confirm that the material meets the design criteria. If the materials fail to meet the criteria, DB Contractor shall be responsible to take corrective action that is acceptable to the TxDOT.

Effective Plasticity Index (PI). DB Contractor shall demonstrate to TxDOT that the specified design requirements are met by randomly selecting at least one (1) location per 2,500 linear feet of roadbed and shall sample the subgrade materials to a depth below finished pavement surface as designated by the

pavement design. Mainlane roadbeds and ramps are considered independently. Sampling shall also take place when a recognizable change in the subgrade material is encountered during grading operations as determined by a change in Unified Soil Classification System classification.

DB Contractor shall provide for the testing of these materials in accordance with Tex-106-E to determine the Effective PI. The results shall be compared to design requirements to confirm that the strata meet the design criteria. If the materials fail to meet the criteria, DB Contractor shall be responsible to take corrective action that is acceptable to TxDOT.

Smoothness Specification. Smoothness of the pavement constructed shall conform to the requirements of TxDOT Item 585, Ride Quality for Pavement Surfaces, amended as cited below:

Article 585.3D. Acceptance Plan and Pay Adjustments. The entire section is voided and replaced by the following:

TxDOT will evaluate profiles based on the Construction Quality Acceptance Firm (CQAF) test results to determine acceptance and corrective action. Corrective action acceptable to TxDOT is required, at DB Contractor's sole expense, for any 0.1-mile section that measures an average IRI in excess of 75 inches per mile for rigid pavements. After making corrections, re-profile the pavement section to verify that corrections have achieved the required level of smoothness.

Use diamond grinding or other methods approved by TxDOT to correct surface areas that have more than 1/8 inch variation between any two (2) contacts on a 10-foot straightedge. Use diamond grinding or other approved methods to remove localized roughness as determined using an inertial profiler in accordance with TEX-1001-S.

Article 585.4 Measurement and Payment. The entire section is voided.

Smoothness Specification for state maintained overlay areas. The International Roughness Index (IRI) for overlay areas defined in Section 19.1.7 (Frontage Roads) shall be reduced to 50% of the existing IRI upon completion of surface placement. When achieving 50% of the existing IRI is not feasible, a maximum IRI of 65 inches/mile shall be provided. Pretesting and posttesting shall be performed by DB Contractor and results shall be submitted to TxDOT for review.

9 LAND SURVEYING

9.1 General Requirements

DB Contractor shall provide accurate and consistent land surveying and mapping necessary to support design and construction of the Project.

DB Contractor shall review existing survey data and determine the requirements for updating or extending the existing survey and mapping data. DB Contractor is responsible for the final precision, accuracy, and comprehensiveness of all survey and mapping.

9.2 Administrative Requirements

9.2.1 Standards

DB Contractor shall ensure that all surveying conforms to the TxDOT *Survey Manual* and *General Rules of Procedures and Practices* of the Texas Board of Professional Land Surveying. DB Contractor shall ensure that any person in charge of a survey field party is proficient in the technical aspects of surveying.

9.2.2 Right-of-Entry

DB Contractor shall secure written permission prior to entering any private property outside the ROW. It shall be DB Contractors' sole responsibility to negotiate this permission, and DB Contractor shall be responsible for any and all damages and claims resulting from that ingress. Proper documentation of right-of-entry shall be maintained at all times by DB Contractor.

9.2.3 Survey by TxDOT

In performing surveys for other adjoining projects, TxDOT may need to verify and check DB Contractor's survey work. DB Contractor shall assist TxDOT in coordinating with the contractor(s) of the adjoining project(s) regarding planned construction activities. DB Contractor shall notify TxDOT within two (2) Business Days if TxDOT stakes and marks are altered or disturbed.

9.3 Design Requirements

9.3.1 Units

All survey Work shall be performed in U.S. Survey Feet. Work shall conform to State Plane Coordinates.

The surface adjustment factors for the Project are as follows:

Table 9-1: Surface Adjustment Factors

County	State Plane to Surface (NAD 83)	Surface to State Plane (NAD 83)
Tarrant	1.000120000	0.999880014

9.3.2 Survey Control Requirements

DB Contractor shall base all additional horizontal and vertical control on the control provided by TxDOT.

DB Contractor shall establish and maintain additional survey control as needed throughout the duration of the Project. DB Contractor shall tie any additional horizontal and vertical control for the Project to the TxDOT-supplied control network. If DB Contractor chooses to use GPS methods, DB Contractor shall meet the accuracy of the appropriate level of survey as defined in the TxDOT *Survey Manual* and shall utilize the survey control to be provided by TxDOT.

All survey control points shall be set and/or verified by a Registered Professional Land Surveyor licensed in the State of Texas.

Monuments shall be TxDOT Bronze-survey markers installed and marked as directed by the most current edition of the TxDOT *Survey Manual*. DB Contractor shall make all survey computations and observations necessary to establish the position of all other control points based on the primary control provided and meet the correct TxDOT Level of Survey Accuracy standards.

DB Contractor shall deliver to TxDOT a listing of all primary and secondary control coordinate values, original computations, survey notes, and other records, including GPS observations and analysis made by DB Contractor, as the data becomes available. DB Contractor shall comply with the TxDOT GPS Specifications found in Table 3.6 of the TxDOT *Survey Manual.*

9.3.3 Conventional Method (Horizontal & Vertical)

If DB Contractor chooses to use conventional methods to establish additional horizontal control, DB Contractor shall meet the accuracy of the appropriate level of survey as defined in the following tables:

9.3.3.1 Horizontal Accuracy Requirements for Conventional Surveys

Horizontal control is to be established (at a minimum) on the Texas State Plane Coordinate System NAD 83.

Table 9-2: Horizontal Accuracy Requirements

	LEVEL 3	LEVEL 4	REMARKS AND FORMULAE
Error of Closure	1:50,000	1:20,000	Loop or between monuments
Allowable Angular Closure	± 3" $\sqrt{N}$	± 8" $\sqrt{N}$	N= number of angles in traverse
Accuracy of Bearing in Relation to Course *	± 04”	± 10”	Maximum for any course
Linear Distance Accuracy (Minimum Length of Line)	1:50,000 (2,500 feet)	1:20,000 (1,000 feet)	
Positional Tolerance of Any Monument	AC/50,000	AC/20,000	AC = length of any course in traverse
Adjusted Mathematical Closure of Survey (No Less Than)	1:200,000	1:200,000	

* TxDOT policy requires all bearings or angles to be based on the following source: grid bearing of the Texas Coordinate System of 1983, with the proper zone and epoch specified.

9.3.3.2 Vertical Accuracy Requirements for Conventional Surveys

Vertical control shall be established (at a minimum) on the North American Vertical Datum of 1988 (NAVD 1988).

Table 9-3: Vertical Accuracy Requirements

	1st ORDER	2nd ORDER	3rd ORDER	REMARKS AND FORMULAE
Error of Closure	0.013 feet $\sqrt{K}$	0.026 feet $\sqrt{K}$	0.039 feet $\sqrt{K}$	Loop or between control monuments
Maximum Length of Sight	250 feet	300 feet		With good atmospheric conditions
Difference in Foresight and Backsight Distances	±10 feet	±20 feet	±30 feet	Per instrument set up
Total Difference in Foresight and Backsight Distances	±20 feet. per second	±50 feet per second	±70 feet per second	Per total section or loop
Recommended Length of Section or Loop	2.0 miles	3.0 miles	4.0 miles	Maximum distance before closing or in loop
Maximum Recommended Distance Between Benchmarks	2000 feet	2500 feet	3000 feet	Permanent or temporary benchmarks set or observed along the route
Level Rod Reading	± 0.001 foot	± 0.001 foot	± 0.001 foot	
Recommended Instruments and Leveling Rods	Automatic or tilting w/ parallel plate micrometer precise rods	Automatic or tilting w/ optical micrometer precise rods	Automatic or quality Texas standard, quality rod	When two or more level rods are used, they should be identically matched
Principal Uses	Broad area control, subsidence or motion studies jig & tool settings	Broad area control, engineering projects basis for subsequent level work	Small area control, drainage studies, some construction and engineering	

9.3.4 Right of Way Surveys

9.3.4.1 Accuracy Standard

In performing ROW surveys consisting of boundary locations, DB Contractor shall meet the accuracy standards of the appropriate level of survey as defined in the following table.

Table 9-4: CHART OF TOLERANCES

	URBAN / RURAL	URBAN BUSINESS DISTRICT	REMARKS AND FORMULAE
Error of Closure	1:10,000	1:15,000	Loop or between Control Monuments
Angular Closure	15" $\sqrt{N}$	10" $\sqrt{N}$	N = Number of Angles in Traverse
Accuracy of Bearing in Relation to Source *	20 "	15 "	Sin α = denominator in error of closure divided into 1 (approx.)
Linear Distance Accuracy	0.1 foot per 1,000 feet	0.05 foot per 1,000 feet	Sin α x 1000 (approx.) where ± = Accuracy of Bearing
Positional Error of any Monument	*AC*/10,000	*AC*/15,000	*AC* = length of any course in traverse
Adjusted Mathematical Closure of Survey (No Less Than)	1:50,000	1:50,000	

* TxDOT policy requires all bearings or angles to be based on the following source: grid bearing of the Texas Coordinate System of 1983, with the proper zone and epoch specified.

9.3.5 Survey Records and Reports

DB Contractor shall produce a horizontal and vertical control report including coordinate listing, maps showing control, preparation of standard TxDOT data sheets for all primary control, monument description, and location description of all primary and secondary survey control points installed, marked, and referenced, along with a listing of the existing control used to create the installed control points signed and sealed by a Registered Professional Land Surveyor licensed in the State of Texas. Control from adjoining, incorporated, or crossed roadway projects, which are currently in design, will be located and a comparison of the horizontal and vertical values will be shown. DB Contractor shall provide survey records and reports to TxDOT upon request.

DB Contractor may use an electronic field book to collect and store raw data. DB Contractor shall preserve original raw data and document any changes or corrections made to field data, such as station name, height of instrument, or target. DB Contractor shall also preserve raw and corrected field data in hardcopy output forms in a similar manner to conventional field book preservation.

Field survey data and sketches that cannot be efficiently recorded in the electronic field book shall be recorded in a field notebook and stored with copies of the electronic data.

All field notes shall be recorded in a permanently bound book. (Loose leaf field notes will not be allowed.) DB Contractor shall deliver copies of any and all field notebooks to TxDOT upon request.

9.4 Construction Requirements

9.4.1 Units

All survey Work shall be performed in U.S. Survey Feet. Work shall conform to State Plane Coordinates.

9.5 Deliverables

9.5.1 Survey Records

DB Contractor shall deliver to TxDOT, for its review and acceptance, a listing of all primary, secondary control coordinate values, original computations, survey notes, and other records including GPS observations and analysis made by DB Contractor ninety (90) days prior to Substantial Completion.

9.5.2 Final ROW Surveying and Mapping

Not applicable.

9.5.3 ROW Monuments

Not applicable.

9.5.4 Record Drawings and Documentation

DB Contractor shall submit the following as part of the Record Drawings and as a condition to Final Acceptance:

a. A listing of all primary and secondary control coordinate values, original computations, and other records including Global Positioning System (GPS) observations and analysis made by DB Contractor;

b. Copies of all survey control network measurements, computations, unadjusted and adjusted coordinate ,and evaluation values; and

c. Survey records and survey reports.

DB Contractor shall produce reports documenting the location of the as-built alignments, profiles, structure locations, Utilities, and survey control monuments. These reports shall include descriptive statements for the survey methods used to determine the as-built location of the feature being surveyed. DB Contractor's as-built data shall include the coordinate types (x, y, and/or z) and feature codes in the same format in which the preliminary construction data was generated. Where data has been provided to DB Contractor from TxDOT in an x, y, z only coordinate format, or z only coordinate format, DB Contractor shall provide TxDOT with data in an x, y, z only coordinate format or z only coordinate format.

10 GRADING

10.1 General Requirements

DB Contractor shall conduct all work necessary to meet the requirements of grading, including clearing and grubbing, excavation and embankment, removal of existing buildings, concrete slabs, fencing, pavement and miscellaneous structures, subgrade preparation and stabilization, dust control, aggregate surfacing, and earth shouldering, in accordance with the requirements of this Section 10 (Grading).

DB Contractor shall demolish or abandon in place, all existing structures within the Project ROW, including but not limited to, pavements, bridges, and headwalls that are no longer required for service, or are required to be treated as described in Section 4 (Environmental). Any features that are abandoned in place shall be removed to at least two (2) feet below the final finished grade or one (1) foot below the pavement stabilized subgrade and drainage structures. DB Contractor shall ensure that abandoned structures are structurally sound and/or harmless to nearby proposed Elements after abandonment.

10.2 Preparation within Project Limits

DB Contractor shall develop, implement, and maintain, for the Term of the DBA Documents, a Demolition and Abandonment Plan that considers types and sizes of Utilities and structures that will be abandoned during the Term. The plan shall ensure that said structures are structurally sound after the abandonment procedure. The plan shall account for both the Project and Ultimate Project conditions and shall be submitted to TxDOT for approval no later than sixty (60) Days prior to issuance of NTP2.

TxDOT reserves the right to require DB Contractor at any time, to salvage and deliver to a location designated by TxDOT within the TxDOT District(s) in which the Project is located, any TxDOT-owned equipment and materials in an undamaged condition.

Below are the locations and quantities of guardrail and end treatments to be salvaged and delivered to the TxDOT Fort Worth District Office:

Southbound

- Left/Side (L/S) (1) before Timberview High School
- Right/Side (R/S) (1) before the Mansfield City Limit sign
- L/S & R/S (2) before the R.R. bridge
- R/S E/B (1) at Broad St.
- L/S (1) before Heritage Pkwy.

Northbound

- L/S & R/S (2) before Heritage Pkwy.
- L/S (1) at the Grand Prairie C/L sign

Any signal equipment specified by TxDOT for salvage shall be delivered to the TxDOT Fort Worth District Signal Shop. Unless otherwise specified by TxDOT, the material from structures designated for demolition shall be DB Contractor's property. All material removed shall be properly disposed of by DB Contractor outside the limits of the Project.

10.3 Slopes and Topsoil

DB Contractor shall use the latest edition of the *AASHTO Roadside Design Guideline* and the December 11, 2013 TxDOT *Roadway Design Manual* regarding design limitations and roadside safety guidelines associated with the design of slopes along roadways. DB Contractor shall adjust grading to avoid and minimize disturbance to any identified waters of the U.S.

DB Contractor shall perform finished grading and place topsoil in all areas suitable for vegetative slope stabilization (and areas outside the limits of grading that are disturbed in the course of the Work) that are not paved. DB Contractor shall use only materials and soils adjacent to pavement layers that do not cause water or moisture to accumulate in any layer of the pavement structure. For areas outside DB Contractor's limits of maintenance, DB Contractor shall provide stable slopes. For proposed, modified or disturbed slopes steeper than 4:1, DB Contractor shall submit to TxDOT a slope stability analysis that demonstrates the adequacy of DB Contractor's design. DB Contractor shall submit the slope stability analysis to TxDOT for approval with the Released for Construction Documents.

10.4 Sodding

Not applicable.

11 ROADWAYS

11.1 General Requirements

The objectives of the Project include the provision of a safe, reliable, cost-effective, and aesthetically-pleasing corridor for the traveling public. The requirements contained in this Section 11 (Roadways) provide the framework for the design and construction of the roadway improvements to help attain the Project objectives.

DB Contractor shall coordinate roadway design, construction, and maintenance with other Elements of the Project to achieve the objectives of the Project.

Where changes to the roadway geometrics result in revisions to the Project ROW, DB Contractor is responsible for demonstrating the proposed change is an equally safe alternative, as well as the initiation and progression of all environmental and public involvement processes in coordination with TxDOT. DB Contractor shall perform all ROW services that are necessitated by proposed changes in accordance with the DBA Documents.

11.2 Design Requirements

DB Contractor shall coordinate its roadway design with the design of all other components of the Project, including aesthetics. The Project roadways shall be designed to integrate with streets and roadways that are adjacent or connecting to the Project. All design transitions to existing facilities shall be in accordance with the December 11, 2013 TxDOT *Roadway Design Manual*.

DB Contractor shall design all Elements in accordance with the applicable design criteria and Good Industry Practice based on the Design Speeds for various Elements. Specifically, the roadway geometric design shall be in accordance with the December 11, 2013 TxDOT *Roadway Design Manual*.

Unless otherwise specified in the DBA Documents, the roadway design shall be governed by current TxDOT policies, specifications, standards, manuals, guidelines, and technical memoranda, including all addenda, supplements, and revisions thereto. Generally, the design shall comply with the criteria established by TxDOT, and AASHTO. The current version (current version as of the Proposal Due Date) of these references shall be used unless otherwise specified.

When no particular standard or criterion is specified in the DBA Documents, then the following hierarchy of standards applies:

- TxDOT Fort Worth and Dallas Districts, as applicable;
- TxDOT;
- Texas Manual on Uniform Traffic Control Devices (TMUTCD);
- AASHTO; and
- Applicable local public agency standards.

In all cases, desirable values will be used unless TxDOT agrees otherwise. Minimum values may only be used with approval by TxDOT. DB Contractor must provide justification for the usage of any minimum standard. Justification based solely of cost or schedule will not result in approval.

The Project roadways shall be designed to incorporate roadway appurtenances, including fences, noise attenuators, barriers, and hazard protection as necessary to promote safety and to mitigate visual and noise impacts on neighboring properties.

11.2.1 Control of Access

DB Contractor is not responsible for acquisition of the control of access shown on the Base Scope Schematic. TxDOT will control access for the Project. However, if DB Contractor's design requires a change to the control of access shown on the Base Scope Schematic, then DB Contractor is responsible for acquiring the new control of access and all associated costs.

DB Contractor shall maintain all existing property accesses shown on the Base Scope Schematic, including those not shown on the Base Scope Schematic, and shall not revise control of access without TxDOT approval and the written agreement of the affected property owner.

11.2.2 Roadway Design Requirements

DB Contractor shall design the Elements of the Project to meet or exceed the geometric design criteria shown in Attachment 11-1 (Roadway Design Criteria), Attachment 11-2 (Cross Street Design Criteria) and as specified in the December 11, 2013 TxDOT *Roadway Design Manual*.

DB Contractor shall coordinate, design, and construct the improvements on crossing streets in accordance with the Governmental Entity having jurisdiction of said roadway.

11.2.2.1 Superelevation

Existing superelevation in areas where ramps are to connect to existing pavement may be retained. Superelevation transitions shall be designed and constructed such that zero percent cross-slopes will not occur on bridges or locations when grades are flatter than 0.35 percent.

11.2.2.2 Roadway Widening's

Except as noted below, pavement widening shall be constructed by extending the existing pavement cross slope.

If proposed widening is sufficient to provide an additional travel lane in a superelevated section, pavement superelevation on the new lane shall comply with the requirements of Attachment 11-1.

In areas where widening will require a cross slope break, the cross slope break shall occur within 1-foot of a proposed lane line. Extending the existing cross slope to the first lane line will be acceptable if the sawcut is past the center of the lane.

11.2.2.3 Roadway Design Deviations

Roadway design Deviations will require prior approval by TxDOT.

11.2.3 Miscellaneous Roadway Design Requirements

All roadside safety devices used on the Project shall meet current crash test and other safety requirements in accordance with TxDOT standards.

Driveways shall be designed in accordance with the guidelines, which will be considered requirements, specified in TxDOT's *Roadway Design Manual* – Appendix C, "Driveways Design Guidelines".

The border width, measured from back of curb, along the SH 360 frontage roads and crossing streets shall be 15 feet minimum unless specified otherwise.

Metal Beam Guard Fence (MBGF) posts shall be steel.

If TxDOT should elect to exercise the Authority bid option item to provide ROW fencing, then DB Contractor shall place ROW fencing in areas that are easily traversable between mainlanes and frontage roads or potential pedestrian crossing areas, in accordance with Authority guidelines, where other physical barriers such as guard rails, concrete barrier, fences and noise barriers do not exist.

Single slope precast concrete traffic barrier ((SSCB(2)-10 (Mod) with grouted pockets shall be placed (permanent install) between mainlanes to prevent vehicle cross-over.

DB Contractor shall provide a ten (10) foot maintenance access to all mowable areas.

12 DRAINAGE

12.1 General Requirements

Efficient performance of the drainage system is an integral part of the performance of the Project. DB Contractor shall account for all sources of runoff that may reach the Project, whether originating within or outside the Project ROW, in the design of the drainage facilities.

If existing drainage patterns and/or flows are revised during the Project design, then DB Contractor shall design and construct a solution that does not have significant adverse impacts to property owners outside the Project ROW. Significant adverse impacts are defined as impacts that have the potential to increase risk to health and human safety, cause and/or exacerbate flooding of developed structures, or significantly increase water surface elevations on undeveloped properties.

DB Contractor shall ensure and demonstrate that drainage design does not cause any material impact to offsite property owners in terms of developability or marketability of their property, or DB Contractor must obtain the appropriate drainage easement at its own cost. Any grading activities or drainage structures needed outside of the Schematic ROW require a permanent drainage easement.

DB Contractor must meet the requirements specified in this Section 12 along with the requirements of the TxDOT Hydraulic Design Manual.

12.2 Administrative Requirements

12.2.1 Data Collection

To establish a drainage system that complies with the requirements and accommodates the historical hydrologic flows in the Project limits, DB Contractor is responsible for collecting all necessary data, including those Elements outlined in this Section 12.2.1 (Data Collection).

DB Contractor shall collect available data identifying all water resource issues, including water quality requirements as imposed by State and federal government regulations; National Wetland Inventory and other wetland/protected waters inventories; FEMA mapped floodplains; and official documents concerning the Project, such as the EA or other drainage and environmental studies. Water resource issues include areas with historically inadequate drainage (flooding or citizen complaints), environmentally sensitive areas, localized flooding, maintenance problems associated with drainage, and areas known to contain Hazardous Materials. DB Contractor shall also identify watershed boundaries, protected waters, county ditches, areas classified as wetlands, floodplains, and boundaries between regulatory agencies (e.g., watershed districts and watershed management organizations).

DB Contractor shall acquire all applicable municipal drainage plans, watershed management plans, and records of citizen concerns. DB Contractor shall acquire all pertinent existing storm drain plans and/or survey data, including data for all culverts, drainage systems, and storm sewer systems within the Project limits. DB Contractor shall also identify existing drainage areas that contribute to the highway drainage system and the estimated runoff used for design of the existing system.

DB Contractor shall obtain photogrammetric and/or geographic information system (GIS) data for the Project limits that depicts the Outstanding National Resource Waters and/or impaired waters as listed by the TCEQ. DB Contractor shall conduct surveys for information not available from other sources.

DB Contractor shall be responsible for creating an inventory of all existing drainage structures, culverts, and storm sewers within the Project corridor. The inventory must include the condition, size, material, location, status, videotape or photographs, and other pertinent information. DB Contractor shall verify that all existing drainage components that are to remain have adequate capacity and design life, as defined

in Section 13.2 of the Technical Provisions, in accordance with TxDOT's procedures. If any of these existing drainage components are found to be hydraulically inadequate or found to have insufficient design life, they must be replaced.

The data collected shall be taken into account in the Final Design of the drainage facilities.

12.2.2 Coordination with Other Agencies

DB Contractor shall coordinate all water resource issues with affected stakeholders and regulatory agencies. DB Contractor shall document the resolutions of water resource issues.

Drainage improvements determined necessary by local Governmental Entities that exceed the requirements of the DBA Documents shall be handled by DB Contractor with a third party agreement between the local Governmental Entity and DB Contractor. The cost associated with any such third party agreements shall be the responsibility of DB Contractor and the Governmental Entity. Such third party agreement shall be subject to TxDOT approval and shall be provided to TxDOT for review thirty (30) days prior to the anticipated date of execution of the agreement.

DB Contractor shall prepare the required documentation, perform the necessary calculations and design, and provide to the local floodplain administrators all information and technical data needed to file Conditional Letters of Map Revision (CLOMR) and Letters of Map Revision (LOMR) with FEMA, if a map revision is found to be warranted.

Drainage areas and structures that fall under the jurisdiction of the United States Army Corps of Engineers (USACE) shall comply with all USACE requirements. DB Contractor shall coordinate review and approval of the design and construction, if necessary, with the USACE on any such facilities. Information regarding the status of permits for work with the USACE is included in the Reference Information Documents. DB Contractor shall be responsible for obtaining applicable USACE permits.

In areas surrounding railroad facilities, DB Contractor shall coordinate with the appropriate railroad owner in accordance with Section 14 (Rail).

12.3 Design Requirements

DB Contractor shall design all Elements of the drainage facilities in accordance with the applicable design criteria and Good Industry Practice.

The design of drainage systems shall include reconfiguration of the existing drainage systems within the Project limits, and design of new and reconfigured storm drainage systems as required to meet the performance requirements as defined in this Section 12 (Drainage). Modifications to existing drainage patterns should be minimized. The Base Scope Schematic provides guidance on the design of new and upgrading existing drainage structures as a reference. DB Contractor is responsible for the final design of all drainage facilities in accordance with this Section 12 (Drainage).

DB Contractor may make use of existing drainage facilities, provided overall drainage requirements for the Project are achieved and the combined drainage system functions as intended. Elements of the existing drainage system determined by DB Contractor to remain in place as part of the drainage system must meet the requirements as detailed in this Section 12 (Drainage).

Elements of the existing drainage system within the Project limits scheduled to remain in place must meet hydraulic capacity requirements as detailed in Section 12 (Drainage). If any Elements of the existing system do not comply with the requirements of Sections 12 (Drainage) and 13 (Structures), those Elements shall be reviewed by TxDOT and subject to replacement by DB Contractor at DB Contractor's sole expense.

DB Contractor shall make available to TxDOT, as part of the Submittals, all native design files used in the hydrologic and hydraulic analyses used in preparing computations and plans. The native files for the models and analyses should represent the record set submitted.

12.3.1 Surface Hydrology

12.3.1.1 Design Frequencies

The DB Contactor shall use the design frequencies listed in Table 12-1 below.

12.3.1.2 Hydrologic Analysis

DB Contractor shall design drainage structures which intercept and convey flow from offsite through the Project (e.g. cross-culverts), with sufficient capacity for the fully developed offsite condition.

The fully developed offsite condition will be determined using the current land zoning and reasonable assumptions for the decreased time of concentration.

Internal drainage systems which convey flow intercepted from the Project shall be designed for the Ultimate Project configuration within the Project ROW.

DB Contractor shall ensure that no significant adverse impacts will result from the construction of the Project. DB Contractor shall evaluate and document the analysis confirming that the proposed drainage improvements do not result in any significant adverse impacts. Detention ponds may be constructed within the Project ROW to mitigate peak flows in order to reduce adverse impacts and utilize as much of the existing drainage infrastructure as possible.

DB Contractor shall be responsible for any mitigation required to ensure that the Project does not create any significant adverse impact. Restrictor plates in storm drain pipes for in-line detention will not be permitted. DB Contractor is not responsible for evaluating or mitigating impacts which may be caused by future offsite development.

Use of underground storage facilities for mitigation of significant adverse impacts is prohibited.

DB Contractor shall contain all increases in water surface elevation upstream of drainage structures which are due to changes between existing and post-Project conditions within ROW or drainage easements. DB Contractor is not responsible for addressing inundation due to future offsite development.

DB Contractor's base hydraulic model should reflect the most current as-built conditions.

Table 12-1: Drainage Design Summary Table

	Drainage Analysis and Evaluation	Q2	Q5	Q10	Q25	Q50	Q100	Q500
Mainlanes	Design frequency for storm sewers, inlets, and laterals where emergency overflow is present. Allowable ponding width is the shoulder			X				
	Design frequency for storm sewers, inlets, and laterals for depressed roadway sections with no emergency overflow. Allowable ponding width is the shoulder.					X		
	Bridges shall be designed to convey a minimum 50-year storm with two (2) feet of freeboard below low chord and shall be capable of passing a 100-year storm with one (1) foot of freeboard. Culverts shall be designed for a minimum of a 50-year storm and to pass a 100-year storm with zero feet of freeboard. The 500-year storm should be calculated for scour computations.					X	X	X
	All features of the roadway facility will be assessed under the 2, 10, 25, 50, & 100 year design storm to ensure no significant adverse impacts.	X		X	X	X	X	
Frontage Roads	Design frequency for storm sewers, inlets, and laterals where emergency overflow is present. Allowable ponding width shall be twelve (12) feet.		X					
	Design frequency for storm sewers, inlets, and laterals for depressed roadway sections with no emergency overflow. Allowable ponding width is the shoulder.					X		
	Bridges shall be designed to convey a minimum 50-year storm (major river crossings) and 25-year storm (small bridges) with two (2) feet of freeboard below low chord. These structures will be capable of passing a 100-year storm with one (1) foot of freeboard. Culverts shall be designed for a minimum of a 10-year storm and to pass a 100-year storm event with zero feet of freeboard. The 500-year storm should be calculated for scour computations.			X	X	X	X	X
	All features of the roadway facility will be assessed under the 2, 10, 25, 50, & 100-year design storm to ensure no significant adverse impacts.	X		X	X	X	X	
City and County Cross-Streets Drainage	Design frequency for storm sewers for urban roadway sections. Allowable ponding width is the depth and width that will allow passage of one (1) lane of traffic.			X				
	Design frequency for open channel and small culverts for rural roadway section.			X				
	Design frequency for inlets along depressed roadways. Allowable ponding width is the depth and width that will allow passage of one (1) lane of traffic.				X			
	Design frequency for culverts and small bridges on local roads and streets shall be for a minimum of a 10-year storm.			X				
	Design frequency for culverts and small bridges on minor arterial and collectors shall be for a minimum of a 25-year storm.				X			
	All features of the roadway facility will be assessed under the 2, 10, 25, 50, & 100 year design storm to ensure no significant adverse impacts.	X		X	X	X	X	

Notes. * A depressed roadway provides nowhere for water to drain even when the curb height is exceeded. Storm drains on facilities such as underpasses, depressed roadways, etc., where no overflow relief is available should be designed for the 2% annual exceedance probability (AEP) event (Q50).

All facilities must be evaluated to the 1% AEP event (Q100).

The freeboard requirement for the existing bridge over Bowman Branch shall be 1' for the 2% AEP. For the existing bridge over Walnut Creek, there shall be no freeboard requirement; however, DB Contractor shall ensure no overtopping for the 1% AEP. No increase in the FEMA Effective water surface elevation (WSEL) is permitted at both Walnut Creek and Bowman Branch. Any increase in the effective 100-year WSEL at any of the Zone AE crossings will require floodplain mitigation and submittal of a CLOMR.

12.3.2 Storm Sewer Systems

Where precluded from handling runoff with open channels by physical site constraints, or as directed in this Section 12 (Drainage), DB Contractor shall design enclosed storm sewer systems to collect and convey runoff to appropriate discharge points.

DB Contractor shall prepare a storm sewer drainage report encompassing all storm sewer systems that contains, at a minimum, the following items:

a. Detailed table of contents and narrative of design methodology

b. Drainage area maps for each storm drain inlet with pertinent data, such as boundaries of the drainage area, best available topographic contours, runoff coefficients, time of concentration, and land use with design curve number and/or design runoff coefficients, discharges, velocities, ponding, and hydraulic grade line data;

c. Location and tabulation of all existing and proposed pipe and drainage structures. These include size, class or gauge, detailed structure designs, and any special designs;

d. Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and pipe alternates; and

e. Complete pipe profiles, including pipe size, type, and gradient; station offsets from the centerline of the roadway; length of pipe; class/gauge of pipe; and numbered drainage structures with coordinate location and elevations.

f. Complete documentation of DB Contractor's assessment of the potential for the Project to cause adverse impacts, including how adverse impacts are mitigated (if needed) and reasonable substantiation that the Project will not cause any significant adverse impacts.

g. Demonstration that the drainage design does not cause any material impact to offsite property owners in terms of developability of their property, or that DB Contractor has obtained appropriate drainage easements.

This report shall be a component of the Drainage Design Report.

DB Contractor shall design all storm sewer systems such that the hydraulic grade line for the design frequency event is at or below the flow line of:

a. Gutter depression for curb inlet;

b. The top of grate inlet; and

c. The top of manhole cover.

Runoff within the jurisdiction of the USACE shall be conveyed in accordance with applicable laws and permits.

The gutter depression used for curb and grate combination inlets shall not encroach into the travel lane if the gutter depression exceeds the normal cross slope.

Place manholes or combination manholes and inlets wherever necessary for clean-out and inspection purposes. See chapter 10, section 6 of the TxDOT *Hydraulic Manual* for the manhole spacing criteria.

The use of "T" connections and "Y" connections in storm sewer systems is not permitted unless approved in writing by TxDOT.

The use of slotted drains will not be allowed.

DB Contractor will not be allowed to mitigate impacts by using restrictor plates or in-line detention facilities.

12.3.2.1 Pipes

DB Contractor shall meet the requirements set forth in Chapter 10, Section 7 of the *TxDOT Hydraulic Design Manual*, revised May 2014.

Storm sewer pipes with design flow velocities less than 3 feet per second (fps) shall be designed for full flow at 80% of the internal diameter to account for sedimentation in the pipe. Other storm sewer pipes shall be designed using the full internal diameter. All storm sewers shall be designed and constructed to sustain all loads with zero deflection and shall have positive seals at the pipe joints.

All pipes shall be reinforced concrete pipe, with the exception of pipe drains for MSE walls.

The minimum pipe size inside diameter shall be 24 inches. The minimum pipe size for pipe drains shall eight (8) inches in accordance with Chapter 10, Section 7 of the *TxDOT Hydraulic Design Manual*.

12.3.2.2 Ponding

DB Contractor shall design drainage systems to limit ponding to the widths defined in Table 12-1 of these Technical Provisions. Mainlane inlets shall be spaced so that ponding width does not encroach onto the mainlanes.

12.3.3 Miscellaneous Drainage Design Requirements

DB Contractor shall design roadside ditches in accordance with Chapter 7, Section 3 of the *TxDOT Hydraulic Design Manual* and the following minimum ditch requirements:

- Freeboard of 1 foot or 2 velocity heads, whichever is greater;
- Minimum grade of 0.5%;
- Design flowline elevation shall be a minimum of six inches (6”) below roadway subgrade; and
- Six foot minimum flat bottom ditches are required unless otherwise approved by TxDOT.

Grate inlets may not be placed within a travel lane but may be placed in adjacent shoulders. Use of trench drains in driveways is permitted. No slotted drains shall be used on this Project.

Drainage structures (pipes, inlets, manholes, etc.) shall not be located within 50’ ahead or behind of a toll gantry.

12.3.3.1 Inlet Design Criteria

Inlets shall be placed in accordance with the criteria shown below in Table 12-2 and the *TxDOT Hydraulic Design Manual*:

Table 12-2: Inlet Design Criteria

Storm Drain Inlets	
Inlet Locations	1. On-grade: Place inlets to keep gutter ponding <= allowable, as defined in Table 12-1. Carryover is acceptable. 2. Low points: Verify inlet location is at low point of vertical curve, not at P.I. Place flanking inlets both sides of low point at a maximum spacing of 100' from low point. 3. Redundant inlets: End of curb returns at intersection. 4. 100% flow interception: On pavement at end of ret. wall, at ramp gores, at intersections. 5. Inlets shall be placed outside the mainlane pavement (proposed and future expansion)

12.3.4 Stormwater Storage Facilities

DB Contractor shall complete design of the stormwater storage facilities to meet requirements for water quality, water quantity, and rate control, as determined by the Texas NPDES regulations.

DB Contractor shall ensure that stormwater storage facilities meet the requirements listed below by performing all required analyses. Such analyses shall include flood routing analysis, which includes a detailed routing analysis for ponds affected by significant environmental issues such as hazardous waste or groundwater concerns.

Pond Locations. Pond locations and all applicable pond information must be developed and coordinated with TxDOT. DB Contractor shall design a Stormwater Management Plan that accounts for any regional ponds.

Inlets and Outlets. Basin inlets must be above the dead sediment storage volume. Basins must be designed to prevent circuiting and discharge of floating debris (e.g., have a skimmer baffle).

Basin Depth and Shape. A length-to-width ratio of 3:1 or more must be maintained.

Any length-to-width ratio variation shall require prior review and acceptance by TxDOT prior to completion of final design. A ten (10) foot bench, with a 10:1 slope or flatter, must be provided at the normal water level for safety and maintenance. In addition, DB Contractor shall comply with the rules contained in the Aggregate Quarry and Pit Safety Act which can be viewed at:

http://www.txdot.gov/inside-txdot/division/maintenance/quarry.html

Freeboard and Spillway. A minimum of two feet of vertical freeboard above the design flood elevations shall be provided on ponds. All ponds must have an emergency spillway sized to carry events beyond the 100-year event.

Design Details. All inlet and outlet details, skimmers, and emergency spillway designs must be included in the design.

Flood Routing. DB Contractor shall perform all flood routing and submit calculations as required to the reviewing authorities, such as municipalities, the TCEQ, and USACE.

Environmental Issues. Special analysis and documentation must be included for ponds affected by significant environmental issues, such as hazardous waste or groundwater concerns.

Documentation. A graphic display (both paper and electronic format) showing which areas are treated by each pond shall be included with the design calculations provided to TxDOT. The display must also show those areas not treated.

Special Ditch Grades. Where needed, special ditch grades shall be designed by DB Contractor. Normal ditch sections shall also be the responsibility of DB Contractor. When necessary, ditch linings shall be designed by DB Contractor according to HEC-15.

12.3.5 Hydraulic Structures

12.3.5.1 Culverts

DB Contractor shall analyze existing and proposed culverts and drainage-ways impacted, replaced, or created by the Project design, for any localized flooding problems.

For all culverts, the maximum allowable headwater elevation for the design frequency shall not exceed the low point at the applicable roadway edge of pavement.

Culverts are classified as major or minor, as follows:

a. Major Culvert: A culvert that provides an opening of more than 35 SF in a single or multiple installations. A major culvert may consist of a single round pipe, pipe arch, open or closed-bottom box, bottomless arch, or multiple installations of these structures placed adjacent or contiguous as a unit. Certain major culverts are classified as bridges when they provide an opening width of more than 20 feet, measured parallel to the roadway; such culverts shall be included in the bridge inventory. Bridge class culverts shall have a minimum rise of 4 feet.

b. Minor Culvert: Any culvert not classified as a major culvert.

The minimum box culvert height, inside dimension, for all proposed box culverts shall be 3 feet. Existing box culverts that meet all other hydraulic requirements may be extended at their existing height.

12.3.5.2 Bridges

All bridge hydraulic computations, designs, and recommendations shall be consistent with past studies and projects in the area by the USACE and other State or federal agency studies and projects.

Where bridge design is influenced by upstream storage, the analysis of the storage shall be considered in the design of the bridge.

12.3.5.2.1 Method Used to Estimate Flows

DB Contractor shall use methods outlined in the *TxDOT Hydraulic Design Manual* for flow determination.

12.3.5.2.2 Design Frequency

Major waterway crossings, bridges, culverts and storm drain systems shall be designed for the frequency corresponding to the functional classification of the associated roadway as shown in Table 12-1. The functional classification for each roadway is shown in Section 11 (Roadways).

DB Contractor shall evaluate bridges for contraction scour and pier scour concerns and incorporate protection in accordance with Good Industry Practice. DB Contractor shall provide a scour analysis in accordance with TxDOT's *Geotechnical Manual* (Chapter 5 – Section 5 Scour) for all bridges. If necessary, DB Contractor shall provide countermeasures for any instability and scour problems in accordance with FHWA Hydraulic Engineering Circular No. 23 - *Bridge and Scour and Stream Instability Countermeasures Experience Selection and Design Guidance*.

12.3.5.2.3 Hydraulic Analysis

DB Contractor shall use the best available hydrologic and hydraulic models as design base models, if such models are available. For waterways which are mapped as FEMA Special Flood Hazard Areas, DB Contractor must comply with TxDOT *Hydraulic Design Manual* procedures, including coordination with the local floodplain administrator(s) and use of the current effective models to create revised effective and proposed effective models. DB Contractor must also ensure coordination with major adjacent developments which are pursuing a FEMA Letter of Map Revision during the Project development period.

DB Contractor shall design riprap at abutments in accordance with the procedures outlined in HEC-23. For bridge abutments in urban areas, DB Contractor shall install protection in accordance with the Project's aesthetic plan.

The following Authority Standard, or most current version, Concrete Riprap with Retaining Wall at Overpass Bridges (STR-001-2007), shall govern the design and construction of concrete riprap at overpass bridges with retaining walls.

12.3.5.2.4 Bridge/Culvert Waterway Design

For existing crossings, DB Contractor shall analyze the existing structure with the proposed flows to ensure the headwater does not exceed allowable head water as defined in Table 12-1. If this condition is not met for the minimum frequency on the completed structures, DB Contractor shall design a replacement structure with sufficient capacity to pass the required design-frequency flows and ensure the maximum headwater for the required frequency event does not exceed that of the corresponding event for the current condition. Culvert extensions may increase the headwater elevation, but not above the maximum allowable headwater, with respect to adjacent property and floodplain concerns.

Bridge waterway design shall minimize changes to the existing channel.

12.3.5.2.5 Bridge Deck Drainage

Stormwater flowing toward the bridge shall be intercepted upstream from the approach slab. Runoff from bridge deck drainage shall be treated as required by TCEQ or other applicable regulation prior to discharge to the natural waters of the State.

Open deck drains and/or slotted rail are not permissible for new bridges passing over waterways or other roadways. The existing frontage road bridges over Bowman Branch and Walnut Creek do not need to be retrofitted with a closed drainage system. If ponding width limits are exceeded on the new bridges, then the runoff must be conveyed in a closed system through the bridge columns to the roadway drainage system below. The bridge deck drainage system shall outlet at the bottom of the substructure either into a storm sewer system, or into an open channel and in no case shall be allowed to discharge against any part of the structure.

12.3.5.2.6 Drainage Report for Major Stream Crossings

DB Contractor shall prepare a report for each major stream crossing. Major stream crossings are defined as waterways listed as a FEMA-mapped Special Flood Hazard Area or requiring a bridge class structure, which is defined as any bridge or a culvert with a total opening width greater than or equal to twenty feet. Any other waterway will be by default a minor stream crossing. The report shall include the detailed calculations and electronic and printed copies of the computer software input and output files, as well as a discussion about hydrologic and hydraulic analysis and reasons for the design recommendations. At a minimum, for each crossing the report shall include:

FEMA Special Flood Hazard Area (SFHA)

a. FIRMette; and

b. Discussion of SFHA and implications.

Hydrology

a. Drainage area maps with watershed characteristics/parameterization including topography, both hardcopy and GIS format;

b. Hydrologic calculations (where computer software is used, both hardcopy and electronic input and output files); and

c. Historical or site data used to review computed flows;

Hydraulics and Recommended Waterway Opening and/or Structure

a. Photographs of the Site (pre- and post-construction);

b. General plan, profile, and elevation of recommended waterway opening and/or structure;

c. Calculations – hardcopy of output, as well as electronic input and output files for all computer models used for final analysis or for permit request, as well as summary of the basis of the models;

d. Cross-sections of waterway (DB Contractor shall provide a hard copy plot, plus any electronic data used); and

e. Channel profiles.

Scour Analysis

a. Channel cross-sections at bridge showing predicted scour;

b. Calculations and summary of calculations, clearly showing predicted scour and assumptions regarding bridge opening and piers used to calculate predicted scour;

c. Discussion of review of long-term degradation/aggradation and effects; and

d. Recommendation for abutment protection.

This report shall be a component of the Drainage Design Report.

DB Contractor shall provide bridge hydraulic summary sheets and bridge scour envelope sheets with projected scour calculation summaries for every bridge crossing a waterway in the final record construction plans set.

12.4 Drainage Design Report

A preliminary Drainage Design Report shall be submitted with prefinal set of construction plans. The preliminary Drainage Design Report shall include at a minimum everything included in the Drainage Design Report.

Within thirty (30) Days of Substantial Completion, DB Contractor shall submit to TxDOT, as part of the Record Drawings, a Drainage Design Report, which shall be a complete documentation of all components of the Project's drainage system. At a minimum, the Drainage Design Report shall include:

a. Record set of all drainage computations, both hydrologic and hydraulic, and all support data including all geospatial data. If computations are in electronic format, the native format shall be submitted (e.g. Microsoft Office Excel *.xlsx, Mathcad *.xmcd);

b. Hydrology/Hydraulic notes, models, and tabulations. Models are to be submitted in native format (e.g. Winstorm file *.stm, HEC RAS *.prj, HEC HMS *.hms). Please note some programs such

as HEC HMS generate multiple files which are essential to the overall model. All files should be included with the Submittal to ensure the results match those in the record set;

c. Storm sewer drainage report;

d. Bridge and culvert designs and reports for major stream crossings;

e. Open channel design data;

f. Complete documentation of DB Contractor's assessment of the potential for the Project to cause adverse impacts, including how adverse impacts are mitigated (if needed), and reasonable substantiation that the Project will not cause any significant adverse impacts;

g. Demonstration that the drainage design does not cause any material impact to offsite property owners in terms of developability or marketability of their property, or that DB Contractor has obtained appropriate drainage easements;

h. Correspondence files which include:

- Meeting minutes pertaining to drainage;
- E-mail and letter correspondence with all Governmental Agencies pertaining to drainage and drainage studies;
- Letters to all Government Agencies pertaining to drainage;

i. Drainage system data (location, type, material, size, and other pertinent information) in a GIS data format for the existing system to remain in place and the proposed system constructed in conjunction with this Project; and

j. Exhibits demonstrating the compatibility of the drainage design with the Ultimate Project configuration.

12.5 Construction Requirements

DB Contractor shall design drainage to accommodate construction staging. The design shall include temporary erosion control measures and other Best Management Practices needed to satisfy the NPDES and other regulatory requirements. The water resources notes in the plans shall include a description of the drainage design for each stage of construction, including temporary drainage Elements.

13 STRUCTURES

13.1 General Requirements

The structural Elements of the Project, including bridges, culverts, drainage structures, signage supports, illumination assemblies, retaining walls, and noise barriers, shall be designed and constructed in conformance with the requirements of the DBA Documents, the current AASHTO *LRFD Bridge Design Specifications* except where directed otherwise by the TxDOT *Bridge Design Manual – LRFD* and the TxDOT *Geotechnical Manual*, in order to provide the general public a safe, reliable, and aesthetically-pleasing facility. For all specifications listed herein, the latest edition, including interims, as of the Proposal due date, shall be used. The plans shall clearly show the specifications, including the edition and dates, employed in each design.

In all instances where TxDOT policies, specifications, standards, manuals, guidelines, and technical memoranda make reference to the TxDOT *Bridge Detailing Manual*, DB Contractor shall reference and utilize the TxDOT *Bridge Detailing Guide* (August 2013) in lieu of the TxDOT *Bridge Detailing Manual*.

13.2 Design Requirements

For bridges, walls, bridge class culverts, sign structures and other miscellaneous structures, a Corridor Structure Type Study and Report shall be submitted to TxDOT for review and comment prior to design of these Elements. At a minimum, structural concepts, details and solutions, soil parameters, hydraulics, environmental requirements, wetland impacts, safety, highway alignment criteria, constructability, aesthetics requirements, compatibility with the Ultimate Project configuration and continuity for the Project shall be evaluated in the Corridor Structure Type Study and Report. Evaluation of existing structures that will be retained shall be included in the Corridor Structure Type Study and Report. The Corridor Structure Type Study and Report shall clearly define DB Contractor's action to achieve a traditional TxDOT seventy-five (75) year service life for Project bridges, walls, culverts and miscellaneous structures.

13.2.1 Compatibility with Ultimate Project

Bridges crossing over the Project shall, at a minimum, be designed to accommodate the Ultimate Project. Accommodations include locating abutments, retaining walls, foundations, and substructures in the Ultimate Project location. DB Contractor shall ensure that bridges constructed for the Project can be widened to the Ultimate Project width at a later date with minimal or no impact to aesthetics and traffic. If a new bridge is part of the Ultimate Project, but is constructed only to an interim width, and if the outside columns of this bridge are not constructed until the Ultimate Project, then the outside bridge columns at the interim width are not required to meet the outside bridge column aesthetic requirements of the Ultimate Project bridge. DB Contractor shall design bridge structures required for the Project, if applicable, to the total length and span arrangement required for the Ultimate Project, including spanning future lanes that will be constructed below the structure as a part of the Ultimate Project.

13.2.2 National Bridge Inventory (NBI) Reporting Procedures

Upon completion of the bridge layout during the design phase, DB Contractor shall coordinate with the TxDOT District Bridge Engineer to obtain National Bridge Inventory numbers for all bridges and bridge class culverts. This will require an approved bridge layout and completion of the PSN Request Form shown in Attachment 13-1. The NBI numbers shall be shown on the applicable layout sheets of the Final Design Documents.

DB Contractor shall stencil NBI numbers on all bridge structures. Place the NBI numbers on each side of the structure on the exterior beam closest to the abutment. Place the stencils on opposing corners of the structure.

13.2.3 Design Parameters

Unless otherwise noted, design for all roadway and pedestrian structural Elements shall be based on the Load and Resistance Factor Design (LRFD) methodology included in TxDOT's *Bridge Design Manual – LRFD,* TxDOT bridge design guidance and recommendations listed at http://www.txdot.gov/inside-txdot/division/bridge/specifications.html and the AASHTO *LRFD Bridge Design Specifications*.

LRFD provisions apply to new structures, widened portions of existing structures and existing structures originally designed to LRFD provisions.

Design of rehabilitation of existing structures or unmodified portions of existing structures not originally designed to LRFD provisions will be governed by their original design requirements as defined in the AASHTO *Standard Specifications for Highway Bridges*, but never less than HS-20 loading.

Any component with a condition rating less than 7 as determined in the condition survey and any other defects discovered by the DB Contractor shall be rehabilitated. DB Contractor shall perform inspections using inspectors, pre-approved by TxDOT, with previous experience inspecting TxDOT bridge inventory. The inspectors shall confirm rehabilitation has achieved a minimum condition rating of 7 for each structural component at Substantial Completion.

Design of foundations shall be in compliance with provisions of the TxDOT *Geotechnical Manual*.

Sidewalks shall be provided on bridge structures in accordance with the provisions of Section 20. DB Contractor shall design sidewalks to meet the criteria of the AASHTO *Roadside Design Guide*.

Steel bridge design shall comply with TxDOT *Preferred Practices for Steel Bridge Design, Fabrication, and Erection.*

Corrosion protection measures shall be in accordance with TxDOT Bridge Division and District practices. These can be found at:
http://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/district_corrosion.pdf

Segmental bridges shall additionally conform to the requirements of AASHTO *Guide Specifications for Design and Construction of Segmental Concrete Bridges.*

Pedestrian bridges shall additionally conform to the requirements of AASHTO *LRFD Guide Specifications for Design of Pedestrian Bridges*.

Hydraulic design shall be in accordance with TxDOT *Hydraulic Design Manual,* FHWA *Hydraulic Engineering Circular (HEC)-18* and *HEC-23*, and TxDOT *Geotechnical Manual.*

Structural design of signs, luminaires and traffic signals shall be in accordance with AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.*

Falsework, shoring and other temporary supports shall be designed in accordance with AASHTO *Guide Design Specifications for Bridge Temporary Works.*

DB Contractor shall inspect all structures that are to be reused, lengthened or widened in accordance with AASHTO *Manual for Bridge Evaluation* and TxDOT *Bridge Inspection Manual.*

Load ratings shall be in accordance with AASHTO's *Manual for Bridge Evaluation* and TxDOT's *Bridge Inspection Manual.*

13.2.4 Bridge Design Loads and Load Ratings

All roadway bridges and bridge class culverts shall be designed to accommodate the following live loads:

a. For new construction, an HL-93 truck or a tandem truck, plus lane load as defined in the AASHTO *LRFD Bridge Design Specifications* shall be utilized for bridges except pedestrian bridges; and

b. Pedestrian bridges and sidewalks of vehicular bridges shall be loaded in accordance with requirements in the AASHTO *LRFD Bridge Design Specifications* and the AASHTO *Guide Specifications for Design of Pedestrian Bridges*. In addition, all pedestrian bridges shall also be designed for an AASHTO H-10 truck live load as defined in the AASHTO *Standard Specifications for Highway Bridges*, to account for maintenance and emergency vehicles.

Unless otherwise indicated, outside bays of new and widened structures shall be designed for an additional 400 plf utility load to be distributed between two beams for both mainlane and cross street bridges.

For bridge widenings and partial replacements, HL-93 loading shall be used for the widening and portions replaced. Designate existing, widening and partial replacement loading on bridge layouts.

DB Contractor shall complete a load rating of existing structures to be widened. Ratings shall be based on current TxDOT procedures.

For existing bridge structures, an inventory load rating of HS-20 shall be obtained. Structures failing to meet this standard shall be rehabilitated to an inventory load rating of HS-20 or replaced using LRFD design and HL-93 loading.

For existing bridge class culverts, an operating load rating of HS-20 shall be obtained. Structures failing to meet this standard shall be rehabilitated to an operating load rating of HS-20 or replaced using LRFD design and HL-93 loading.

DB Contractor shall provide to TxDOT both an inventory and operating rating of the constructed structures along with a copy of the signed and sealed calculations with the Record Drawings.

13.2.5 Bridge Decks and Superstructures

Fracture critical members shall not be used for bridges without written authorization from TxDOT, and if allowed by TxDOT, fracture critical members shall be designed to allow full access for inspection.

The type of bridge shall not be restricted to those typically used by TxDOT. Other types and components may be used, but will be allowed only if:

a. They have been accepted for general use by FHWA; and

b. DB Contractor can demonstrate that the design of the bridge type and components will meet the functional requirements of the Project.

Modular joints shall be used when anticipated movement exceeds five (5) inches and shall be designed and tested for fatigue loading.

DB Contractor shall minimize the number of deck joints wherever possible. DB Contractor shall locate joints to provide for maintenance accessibility and future replacement.

Use of epoxy-coated steel shall conform to corrosion protection measures in accordance with TxDOT Bridge Division and Fort Worth District practices.

DB Contractor shall design sidewalks to meet the criteria of the AASHTO *Roadside Design Guide* and to protect sidewalks from vehicular impact by a TxDOT-approved bridge railing as required in the TxDOT *Bridge Railing Manual* based on roadway Design Speed. Combination rail is required along structure pavement edge of deck where sidewalk is adjacent to outside rail.

To the extent possible, DB Contractor shall make bridge superstructures, joints, and bearings accessible for long-term inspection and maintenance. DB Contractor shall make open-framed superstructures accessible with walkways or by use of ladders or an under-bridge inspection truck.

Steel and concrete box girders and caps (substructure) shall be accessible without impacting traffic below; DB Contractor shall make steel and concrete box girders and caps (substructure) with a minimum inside depth of six (6) feet to facilitate interior inspection. DB Contractor shall include a minimum access opening of 3 feet – 0 inch diameter into all cells and between cells of the girders to allow free flow of air during inspections. The outside access opening cover shall hinge to the inside of the box girder and caps (substructure). An electrical system (110V and 220V) shall be incorporated inside the box girder and caps (substructure) with lighting and power outlets. DB Contractor shall install air-tight, sealed and locked entryways on all hatches and points of access.

Segmental bridges shall additionally conform to the following:

a. Segmental bridge decks shall use deck protection systems to prevent infiltration of corrosive agents into reinforcing in the superstructure. The deck protection system used shall be such that cracking is minimized and adequate bond strength is developed with the superstructure;

b. If monolithically cast overlay is used as part of the deck protection system, DB Contractor shall develop fully engineered design guidelines for the thickness of the monolithic concrete removed and replaced in a manner that keeps distress and changes in surface profile at the time of concrete removal to levels that do not reduce the structural integrity of the structure;

c. All expansion joints shall be sealed or drained. External tendons, if used, shall be protected with a water-tight duct jointing system; and

d. The design, detail, and construction of segmental bridges shall provide for the easy addition of supplemental post-tensioning.

13.2.6 Bridge Foundations

Integral abutments, where the superstructure is structurally framed (either completely or partially) into the abutment, shall not be permitted. MSE walls shall not serve as structural foundations for bridges on the Project, and shall not be subjected to vertical loads from the bridges. Bridge approach slabs or other settlement mitigation measures shall be designed and constructed to mitigate settlement immediately behind abutment backwalls.

Spread footing foundations are not allowed.

13.2.7 Bridge Railing and Barriers

All barrier systems used on the Project shall meet current crash test criteria as specified in NCHRP Report 350 or the AASHTO *Manual for Assessing Safety Hardware* (MASH) and other safety requirements as determined by TxDOT. All testing and associated costs for non-standard railings shall be the sole responsibility of DB Contractor and shall be accomplished through a third party acceptable to TxDOT. A current list of standard railing is provided in the TxDOT *Bridge Railing Manual*. DB Contractor shall protect sidewalks from vehicular impact by using TxDOT-approved bridge railings for high speeds.

13.2.8 Retaining Walls

The type of wall shall not be restricted to those typically used by TxDOT. Other types and components may be used, but will be allowed only if:

a. DB Contractor can demonstrate that the design of the wall type and components shall meet the functional requirements of the Project; and

b. DB Contractor provides the appropriate certifications from the PSQCM and CQAM verifying that an independent review of the walls has been performed and that the walls have been designed and constructed to engineering standards appropriate to the site conditions.

Modular walls employing interlocking blocks shall not be used where surcharge loads from vehicular traffic are present.

The design of wall structures shall take into account live load surcharges. DB Contractor shall apply the appropriate live loading condition (vehicular, heavy rail, transit, etc.) that each wall is subjected to. These live load surcharges shall be based on the latest AASHTO *LRFD Bridge Design Specifications*, American Railway Engineering and Maintenance-of-Way Association (AREMA) *Manual for Railway Engineering*, or the requirements of the specific railroad and transit owner/operator, as appropriate.

Structural integrity of retaining walls shall be inspected and monitored in accordance with Good Industry Practice. Tolerances and mitigation measures shall be in accordance with the Maintenance Management Plan and Good Industry Practice.

The retaining wall layout shall address slope maintenance above and below the wall.

To the extent possible, DB Contractor shall design and construct components of the Project and Ultimate Project to provide embankments without the use of retaining walls. Where earthen embankments are not feasible, DB Contractor may use retaining walls. These retaining walls shall be located and designed such that the Ultimate Project can be implemented, unless specified otherwise, with little to no rework or impact on traffic. The interim foundations shall be designed and constructed to include any additional height and weight associated with the Ultimate Project.

If pipe culverts are to extend through the retaining walls or noise barriers, the pipe shall be installed so that no joints are located within or under the wall.

No weep holes through the face of the retaining walls will be allowed, except at the base of the walls.

Underdrains are required and shall be a minimum of eight (8) inches with cleanouts at a maximum of 300 foot spacing. Outfalls for underdrains must be provided.

Retaining walls shall end at-grade or riprap shall be used to avoid soil erosions.

Select backfill used within the MSE wall reinforced volume shall conform to Ty A as determined by the test method TEX-110-E as noted under Item 423 of the TxDOT Standard Specifications. No gravel or sand is to be used as select backfill.

13.2.9 Noise/Sound Barriers

DB Contractor shall design and construct all noise barriers necessary to achieve the decibel reduction requirement in the SH 360 Environmental Assessment (FONSI) dated January 16, 2014.

Any damage to noise barriers caused by DB Contractor-Related Entities or third parties shall be repaired in accordance with the DBA Documents.

Panel design and construction shall limit the risk of falling debris resulting from traffic impacting the noise wall.

Timber noise barriers are not allowed.

13.2.10Drainage Structures

In developing the design of drainage structures, DB Contractor shall account for maximum anticipated loadings for both the Project and Ultimate Project conditions.

Energy dissipaters, if used, shall be considered as structural Elements.

DB Contractor shall analyze existing drainage structures for capacity and as necessary retrofit or replace Elements to accommodate any additional loads, settlements, and/or other structural impacts associated with the Project.

13.2.11 Sign, Illumination, and Traffic Signal Supports

For bridges and walls longer than 500 feet, sign supports shall be provided at 500-foot intervals. The sign supports shall accommodate sign areas up to and including 16 SF.

DB Contractor shall design overhead and cantilever sign supports to accommodate both the Project and Ultimate Project conditions. Cantilever and sign bridge supports shall be placed outside the clear zone or shall be otherwise protected by appropriate safety measures.

13.2.12 Structures to be Used in Place or Rehabilitated

For existing structures to be used in place or rehabilitated, TxDOT will provide condition surveys.

13.2.13 Structures to be Closed or Removed

When a structure is taken out of service or no longer usable, DB Contractor shall notify the TxDOT project manager within the following business day.

13.2.14 Structure Opening

When a structure is being partially or completely opened to traffic, DB Contractor shall notify the TxDOT project manager 10 business days before opening.

13.2.15 Vertical and Horizontal Clearance for Structures

A minimum of 16 feet -6 inch vertical clearance shall be provided for all new bridges over or under existing or proposed roadways unless noted below. Minimum vertical clearances shall be designed to consider accommodation of the Ultimate Project configuration. The actual vertical clearance shall be measured by DB Contractor. All vertical clearances shall be field measured prior to fabrication of clearance signs. Bridge supports shall be placed outside of the clear zone in accordance with the minimum horizontal clearance requirements specified in Attachment 11-1.

13.3 Construction Requirements

Construction shall be in accordance with TxDOT Standard Specifications.

13.3.1 Concrete Finishes

All concrete surfaces that do not have aesthetic treatments shall have a uniform texture and appearance. Color treatment, where required as an aspect of the aesthetic treatment of the concrete, shall be uniform in appearance. Ordinary Surface Finish, as defined by TxDOT Standard Specifications, shall be applied to the following as a minimum:

a. Inside and top of inlets;

b. Inside and top of manholes;

c. Inside of sewer appurtenances;

d. Inside of culvert barrels;

e. Bottom of bridge slabs between girders or beams;

f. Vertical and bottom of surfaces of interior concrete beams or girders;

g. Wingwalls and headwalls;

h. Ripraps, mowstrips and flumes; and

i. Traffic railing.

13.3.2 Structure Metals

Welding shall be in accordance with the requirements of the AASHTO/AWS D1.5 *Bridge Welding Code* and TxDOT Standard Specifications, Item 448, Structural Field Welding.

13.3.3 Steel Finishes

All steel girders shall be uncoated weathering steel. Except for weathering steel, all structural steel shall be protected. The color for structural steel paint shall conform to the aesthetic scheme of the Project.

If weathering steel is used, DB Contractor shall protect all components of the structure (superstructure and substructure) that are susceptible to corrosion and/or staining from weathering steel run-off.

13.3.4 Steel Erection

Steel Erection shall be in accordance with AASHTO/NSBA Steel Collaboration 510.1-2007. Inspection of steel erection will include oversight by TxDOT personnel.

14 RAIL

14.1 General Requirements

The Project includes a potential future rail corridor within the Project ROW. If DB Contractor's design results in the placement of any permanent structure or retained fill within the limits of the future rail typical section identified on the Ultimate Schematic, that materially differs from that contemplated on the Base Scope Schematic, then the design concept shall be submitted as an ATC for TxDOT review and approval.

14.2 Railroad Design Standards

The design for all railroad Elements of the Project shall be based on the most recent American Railway Engineering and Maintenance of Way Association (AREMA) and the requirements of operating railroad. If the railroad Elements of the Project are being constructed within an existing quiet zone, any new or changes to existing crossing protection(s) must be approved by the operating railroad and comply with the supplemental safety measures as outlined in 49 CFR Parts 222 and 229, and must not negatively impact or degrade the existing quiet zone classification. DB Contractor's design shall minimize service interruptions to existing rail lines.

All work involving railroad companies, work on railroad Right of Way (ROW), and the development and execution of railroad programs shall be in accordance with State and federal law and the practices, guidelines, procedures and methods contained in the TxDOT *Traffic Operations Manual*, Railroad Operations Volume and *Amendments for the TxDOT's Traffic Operations Manual*, Railroad Operations Volume, February 2000. Additionally, the requirements of the owner of each rail facility crossed shall be compared to the requirements in the TxDOT manual, and the most restrictive criteria shall be utilized.

At highway-rail grade crossings, the roadway and drainage design parameters shall be maintained at the crossing with the exception of the cross slope of the pavement which may be transitioned to match the grade across the rail line. The structural design of any Utilities, including drainage structures, installed by DB Contractor and crossing a rail line, shall be in accordance with the operating railroad's design criteria. DB Contractor shall coordinate, design and construct the construction staging, including any shooflies, with the operating railroad.

DB Contractor's design shall minimize service interruptions to existing rail lines. DB Contractor shall coordinate with the impacted railroad and other appropriate Governmental Entities at least thirty (30) Business Days in advance of any anticipated service interruptions.

14.2.1 Design Criteria

Unless otherwise approved by the operating railroad, the minimum vertical clearance as shown in Chapter 11 of the Technical Provisions shall be required over the entire railroad ROW within the Project limits.

DB Contractor shall avoid placement of bridge columns or other structures inside railroad ROW to the extent possible. Any such placements inside railroad ROW require approval of the operating railroad. DB Contractor shall be responsible for attaining required approvals.

DB Contractor may refer to the Reference Information Documents for various design and construction details or specifications commonly used by the Fort Worth District and railroads operating within the district. DB Contractor bears sole responsibility for verifying the completeness and accuracy of this information.

14.3 Administrative Requirements

14.3.1 Railroad Agreement

DB Contractor shall be responsible for obtaining the required approvals, permits, and agreements as required for the Work, including any railroad related Work.

DB Contractor shall obtain all approvals, permits and agreements as required prior to performing any Work impacting a railroad. Construction and Maintenance (C&M) Agreements shall be between TxDOT, DB Contractor, the appropriate railroad company and appropriate Governmental Entities and may take twelve months or more to obtain from the railroad company. Current approved templates for TxDOT/railroad company agreements are available from the TxDOT Rail Division at Rail-Highway.Section@txdot.gov and in the RID.

The following agreements may be required based upon the railroad's requirements:

a. Preliminary Engineering – Most railroads require preliminary engineering agreements in order to proceed with the development and review of plans. This agreement authorizes reimbursement to the railroad company for preliminary engineering and estimating performed by the railroad or their consultant(s). DB Contractor shall prepare the draft agreement to be executed between railroad and DB Contractor.

b. License to Cross and C&M Agreement (License and C&M Agreement) – DB Contractor shall prepare the draft agreement to be executed between railroad, DB Contractor and TxDOT. A License to Cross railroad ROW is normally required when the highway project involves a new crossing or grade separation of the railroad. A separate easement agreement may be obtained in lieu of the License to Cross. DB Contractor shall prepare all the documents required to obtain the License and C&M Agreement, including preparation of the plans and specifications and estimates, making necessary modifications as required on behalf of TxDOT. DB Contractor shall submit the draft License and C&M Agreement to TxDOT for transmittal to the railroad. After all comments have been incorporated or satisfactorily resolved by any or all of DB Contractor, railroad or TxDOT, DB Contractor shall submit a complete and final agreement to TxDOT for execution. This agreement shall include provisions for each party's access to the facilities for regular inspection, maintenance as well as emergency repairs as required.

   - Aerial Easements (for grade separations only) - DB Contractor may be required by the railroad company to enter into a separate easement agreement to obtain air rights to cross railroad ROW. If an aerial easement is required, the "License" portion of the C&M Agreement will be modified to identify the aerial easement as the right to cross railroad ROW with the new highway facility.

   - Temporary Construction Easements - DB Contractor may be required to purchase a temporary construction easement for the railroad company. This requirement will be stipulated in and be a part of the C&M Agreement.

c. Railroad's Contractor Right-of-Entry Agreements (Texas approved versions only) – In order to enter the railroad's right-of-way to perform the Work, DB Contractor or its Subcontractor shall secure a railroad Right-of-Entry agreement and shall coordinate the arrangements of the necessary agreements directly with the railroad.

All executed agreements shall be submitted in their entirety as part of the Final Design Documents.

DB Contractor shall assume and execute TxDOT's responsibilities and duties as defined in Attachment 14-1 (Railroad Agreement).

14.3.2 Project Work Affecting Railroad Operations

Should the Project cross a railroad ROW owned by an operating railroad, DB Contractor shall coordinate the Work with the operating railroad. DB Contractor shall be responsible for obtaining the required approvals, permits, and agreements as required for the railroad-related Work and shall coordinate the design and installation of all railroad warning devices and traffic signals with the appropriate Governmental Entities and operating railroads.

14.3.3 Agreement for Construction, Maintenance, and Use of Right of Way

Whenever a license agreement for construction, maintenance, and use of railroad ROW (hereinafter called the "License Agreement") between the operating railroad and TxDOT is required, DB Contractor shall prepare all the documentation required to obtain the License Agreement, including preparation of the License Agreement application on behalf of TxDOT, the Plans and specifications, and making necessary modifications as required.

DB Contractor shall submit the draft License Agreement to TxDOT for transmittal to the operating railroad. After all comments have been incorporated or satisfactorily resolved by any or all of DB Contractor, railroad or TxDOT, DB Contractor shall submit a complete and final License Agreement to TxDOT for execution.

14.3.4 Operation Safety

DB Contractor shall arrange with the operating railroad for railroad flagging as required. DB Contractor shall comply with the operating railroad's requirements for contractor safety training prior to performing Work or other activities on the operating railroad's property.

14.3.5 Railroad Right of Entry Agreement

In order to enter the operating railroad's right-of-way to perform the Work, DB Contractor shall secure a railroad Right of Entry Agreement and shall coordinate the arrangements of the necessary agreements directly with the operating railroad.

Executed railroad agreements in their entirety, shall be submitted as part of the Final Design Documents.

14.3.6 DB Contractor Right of Entry Agreement

DB Contractor shall cooperate and coordinate with all operating railroads for access by the operating railroad and/or their agents to the rail ROW as necessary for rail maintenance and operations activities, inspection, repair and emergency responses.

14.3.7 Insurance Requirements

At a minimum, DB Contractor shall procure and maintain, prior to working adjacent to and entry upon operating railroad property, insurance policies naming TxDOT, TxDOT's Consultants, and railroad as named insured.

DB Contractor shall obtain the following types of insurance:

- Railroad Protective Liability Insurance Policy
- Comprehensive General Liability Insurance
- Contractors' Protective Liability Insurance.

All insurance policies shall be in a form acceptable to the operating railroad. Copies of all insurance policies shall be submitted to TxDOT prior to any entry by DB Contractor upon operating railroad property.

14.4 Construction Requirements

DB Contractor shall comply with all construction requirements and specifications set forth by the operating railroad.

DB Contractor shall be responsible for scheduling the work to be completed by the operating railroad as well as the work to be completed by its own forces. DB Contractor shall be responsible for all costs associated with the railroad/transit force account work.

15 AESTHETICS AND LANDSCAPING

15.1 General Requirements

This Section 15 defines requirements for DB Contractor to design and construct aesthetic treatments for the roadway, structures and landscaping Elements of the Project. DB Contractor shall carefully develop and incorporate appropriate landscape and aesthetic Elements that complement the existing landscape, architectural and community context. Aesthetic treatments shall be designed to harmonize with the local landscape and architecture, as well as the developed themes of the local setting, in accordance with the TxDOT *Landscape and Aesthetics Design Manual* and the Authority's Design Guidelines for aesthetic treatments contained in the RID.

With respect to the design and construction requirements for aesthetic treatments, DB Contractor shall use only the minimum requirements contained in this Section 15, including the Authority's design standards listed below:

- Rail-Mounted Fence (RMF-201-2010)
- Recessed Logo Detail Retaining Wall Logo (LGO-201-2009)
- Recessed Logo Detail Column Logo (LGO-202-2009)
- Cross Street Identification Details (CSI-201-2009)

With respect to landscaping Elements required for the Project, DB Contractor shall install only the minimum landscaping necessary for erosion control, including any Elements to replace features that are removed or destroyed as a result of the Work. Existing landscaping and natural features shall be preserved to the greatest extent possible. DB Contractor is responsible for the replacement of any existing landscaping features impacted or destroyed through performance of the Work, including the restoration of trees and other vegetation impacted.

15.2 Administrative Requirements

This Section 15 presents minimum aesthetics design requirements for Project designs. The following list of items are the required aesthetic Elements of the Project design:

a. Material, finish, color, shape and texture of bridge Elements;
b. Materials, finish, and color of barriers and railings;
c. Finish, color, and texture of retaining walls and noise barriers;
d. Bridge-rail mounted fencing;
e. Recessed logo details for retaining walls and columns; and
f. Cross street identification details.

15.2.1 Aesthetics Concepts

To the extent practicable, the aesthetic Elements shall remain consistent in form, materials, and design throughout the length of the Project where applied. DB Contractor shall coordinate development of the aesthetic Elements of the Project with TxDOT and the Authority.

Based on the guidance provided in Section 15.3 of these Technical Provisions, DB Contractor shall prepare a final aesthetics concept and submit it to TxDOT for review and approval. Approval of the final aesthetics concept shall be a condition to issuance of NTP2. DB Contractor shall work closely with TxDOT and the Authority to prepare a final aesthetics concept that supports and meets TxDOT and the

Authority's expectations regarding aesthetics concepts for the Project. Within thirty (30) days after issuance of NTP1, TxDOT and DB Contractor shall jointly organize a workshop (TxDOT/Authority/DB workshop) to discuss development of the final aesthetics concept and to ensure the concept meets TxDOT and Authority expectations. TxDOT and DB Contractor will jointly develop a draft agenda and determine a suitable location for the workshop.

DB Contractor shall coordinate and work closely with Governmental Entities and neighboring communities in developing, preparing and ensuring concurrence with the final aesthetics concept prior to submitting to TxDOT for review and approval.

15.2.2 Aesthetics Plan

DB Contractor shall prepare an Aesthetics Plan in conformance with the Project's final aesthetics concept and submit it to TxDOT for review and approval.

The Aesthetics Plan shall include all Elements to fully communicate the proposed aesthetic treatment to TxDOT and shall address:

a. All plans, sections, elevations, perspectives, isometrics, etc., as needed to fully communicate the proposed aesthetic treatment to aesthetic Elements; and

b. Drawings showing proposed color schemes of the aesthetic Elements and their locations.

The Aesthetics Plan shall include all plans, elevations, perspectives, isometrics, etc., as needed to fully convey the aesthetic treatment.

This Aesthetics Plan shall be presented in the following format:

a. 11 inches x 17 inches format;

b. Front sided only;

c. Three (3) paper copies, in color; and

d. Three (3) CD copies, with guidelines in portable document format (PDF).

The Aesthetics Plan shall be incorporated into the Final Design engineering drawings.

TxDOT approval of the Aesthetics Plan is required prior to construction of any Elements affected by the plan.

15.2.3 Personnel

The Aesthetics Plan shall be developed under direct supervision of a professional architect, registered in the State of Texas, with experience in designing aesthetic Elements for roadway projects of similar scope and size.

15.3 Design Requirements

15.3.1 Aesthetics Principles and Strategies

DB Contractor shall follow the guidelines and requirements of the approved Aesthetics Plan, as well as the aesthetics principles, requirements, and strategies established by TxDOT for the Project design, including the following:

a. Aesthetics shall not interfere with safety, constructability and maintenance requirements;

b. The Project design shall minimize impact on the existing natural environment to the extent possible;

c. The Project design shall emphasize and enhance the existing natural surroundings to the fullest extent possible;

d. Appropriate geometric shapes for structures shall be used to the extent possible for continuity along the entire length of the Project;

e. All structures shall be carefully detailed so as to achieve the greatest level of aesthetic quality and fit within the regional context;

f. Color, texture, and form shall be used appropriately for all structures;

g. Graphics, signage, and lighting shall be consistent along the entire length of the Project;

h. Aesthetic Elements shall be fully integrated with the overall structural design;

i. Aesthetic Elements shall be easy to maintain and resistant to vandalism and graffiti; and

j. Exposed aggregate finish shall not be used.

15.3.2 Walls

DB Contractor shall incorporate aesthetic treatments to the vertical surfaces of retaining walls, including noise barriers, where the surface is visible from the roadway or adjacent residences.

The aesthetic surface finish for the retaining wall prism panels shall be the Grande Flagstone described in the RID (NTTA Design Manual and Guidelines, MSE Retaining Wall Panels - Grande Flagstone.pdf). The surface finish treatment for noise barriers shall be the Fractured Fin standard finish on the roadway side and Slate Stone (Ashlar Stone) on the community/neighborhood side in accordance with the NTTA Design Guideline Manual dated September 2012, page 103.

DB Contractor shall provide mock-ups (minimum 5’ x 5’) of all proposed retaining wall, hardscape and abutment wall surface treatments for TxDOT approval prior to construction.

DB Contractor shall clearly detail and identify how wall patterns shall be incorporated.

15.3.3 Bridges and Other Structures

All aesthetic treatments for structural Elements shall be coordinated with DB Contractor’s structural design team to facilitate constructability and maintain safety requirements.

Substructure columns, abutments, bridge rails, and other structures shall be consistent in form and texture, with similar shapes and details used for all bridges, in accordance with the Project’s Aesthetics Plan.

No exposed conduits or drain pipes will be allowed on bents, columns, bridge beams, retaining walls, or any other visible surface.

DB Contractor shall ensure that a constant superstructure depth is maintained throughout the bridge length for all bridges.

15.3.4 Maintenance and Establishment Period

DB Contractor shall be responsible for maintaining the landscaping Elements on the Project, in accordance with the requirements of the current TxDOT Standard Specifications and Section 20.3.1 of the DBA, for a period of one (1) year after Substantial Completion of the Project.

If grassed areas develop major weed or erosion problems, DB Contractor shall correct the problems. DB Contractor shall monitor and control weeds where necessary.

15.3.5 Riprap

Concrete paving shall be used in hard-to-reach mowing areas or under structures such as, but not limited to, areas between, near, or next to guard fence posts, sign posts, bent columns, retaining walls, freeway ramp gores, paved ditches, flumes, roadway illumination poles, and ditch inlets to improve roadway appearance.

DB Contractor shall provide recommended mitigation measures for hard-to-reach mowing areas and submit them to TxDOT for review and approval.

15.4 Construction Requirements

DB Contractor shall provide TxDOT sample panels a minimum of sixty (60) Days in advance of starting construction of textured concrete surfaces. DB Contractor shall construct sample panels in accordance with TxDOT Standard Specifications, Item 427.4.B.2.d (Form Liner Finish) that comply with the principles and requirements contained in this Section 15. DB Contractor must obtain TxDOT's review and approval of the sample panels before any construction form liners may be ordered, obtained, or used. DB Contractor shall provide sample panels having a textured portion at least 5.0 feet by 5.0 feet with a representative un-textured surrounding surface.

The approved sample panel shall be the standard of comparison for the production concrete surface texture.

For textured panels or concrete surfaces finished with a coating of paint or stain, DB Contractor shall prepare a corresponding coated panel or surface area of an in-place Element for approval prior to the coating operation.

Color samples shall be provided from the Federal Standard 595B Colors Fan Deck. All sample panels shall be representative of the actual panel that will be placed. Sample panels shall display primary, secondary, and accent colors.

15.5 Aesthetic Enhancements

DB Contractor shall provide adjacent Governmental Entities the opportunity to enhance aesthetic and landscaping features consistent with the requirements herein. The capital and maintenance costs of the adjacent Governmental Entity improvements (Aesthetic Enhancements) shall be the responsibility of the adjacent Governmental Entity. DB Contractor shall coordinate the necessary arrangements directly with the appropriate local Governmental Entity for aesthetic enhancements within the local Governmental Entity's jurisdiction, if so required by the Work.

Aesthetic enhancements shall be incorporated into the final aesthetics concept plan to be submitted to TxDOT for approval.

16 SIGNING, DELINEATION, PAVEMENT MARKING, SIGNALIZATION, AND LIGHTING

16.1 General Requirements

This Section 16 (Signing, Delineation, Pavement Marking, Signalization, and Lighting) includes requirements under which DB Contractor shall design, construct, and maintain all signing, delineation, pavement markings, signalization, and lighting, for the Project.

16.2 Administrative Requirements

16.2.1 Meetings

DB Contractor shall arrange and coordinate all meetings with Governmental Entities that will assume responsibility for maintaining and operating traffic signals and roadway lighting. DB Contractor shall provide TxDOT with notification of such meetings a minimum of forty-eight (48) hours prior to the start of the meeting. TxDOT, in its discretion, may attend such meetings.

DB Contractor shall arrange and coordinate all meetings with requesting agencies or individuals regarding special signs.

16.3 Design Requirements

DB Contractor shall design all signing, delineation, pavement marking, and signalization in accordance with the Authority standards listed below and the latest *Texas Manual on Uniform Traffic Control Devices* (TMUTCD) and TxDOT Standard Specifications.

1. Pavement Markings: MRK-001-2004, FPM (1thru 4)-12 (MOD)
2. Signs:
   - Bridge Mounted Clearance Sign Assembly: BCS-001-2007
   - Sign Details: SGN-005-2009, SGN-004-2008, and SGN-004(2)-2011
   - Station Marker Details: SGN-003-2004
   - Typical Sign Requirements: TSR-08 MOD
   - Cantilever Overhead Sign Support: COS-001-2009, COS-002-2009, and COS-003-2009
   - Overhead Sign Bridge: OSB-001-2009, OSB-002-2007, and OSB-003-2007
   - Sign Mounting Detail: SMD-001-2010

DB Contractor shall design all lighting and electrical power installations in accordance with the National Electrical Code (NEC) and TxDOT Standard Specifications.

16.3.1 Final Design

DB Contractor shall advance the Final Design of the signing, delineation, pavement marking, signalization, and lighting based on the preliminary operational signing and roadway Base Scope Schematic received with the Proposal. Before placing any signs, delineation, third party signs, non-standard sign structures, pavement markings, and lighting, DB Contractor shall provide TxDOT a layout indicating the proposed location of such items.

16.3.2 Signing and Delineation

DB Contractor shall design and install all new signs based on their proposed design. Signs include new signs as well as modifications to existing sign panels and structures. DB Contractor's design shall include the locations of ground-mounted and overhead signs, graphic representation of all signs, proposed pavement markings, delineation placement, guide sign and special sign details, and structural and foundation requirements. Signs shall be located in a manner that avoids conflicts with other signs, vegetation, dynamic message signs (DMS)**,** lighting, and above and below ground structures.

DB Contractor shall ensure that signs are clearly visible, provide clear direction and information for Users, and comply with all applicable TMUTCD requirements and Authority standards.

DB Contractor shall review with TxDOT all requests for new signs, including traffic generators, or modifications of existing sign text. Such requests are subject to TxDOT's approval.

DB Contractor's design of delineators and object markers shall comply with TMUTCD requirements and Authority standards.

Large overhead guide signs shall be placed on separate structures and not mounted on bridge rails.

16.3.3 Project Signs – Outside the Project ROW

For signs located outside the Project ROW but within a public ROW, DB Contractor shall install the signs in existing rights-of-way controlled by Governmental Entities or other State agencies. DB Contractor shall coordinate with appropriate Governmental Entities for the design and installation of such signs.

16.3.4 Station and Mile Markers

DB Contractor shall install station markers along the mainlanes per Authority Standard, Station Marker Details (SGN-003-2004), at 500 foot spacing and at station equations. Mile markers shall be placed along the frontage roads in accordance with TxDOT standards.

16.3.5 Advance Toll Information Signs

Not applicable.

16.3.6 Third-Party Signs

In addition to the warning, regulatory, and guide signs within the Project ROW, TxDOT, or Governmental Entities may request that third-party signs, including logo signs, be installed by a third party. DB Contractor shall coordinate and cooperate with any third party performing such work. TxDOT may solicit input from DB Contractor in reviewing applications for new third-party signs, but will retain sole authority for approving installation of these signs. All costs associated with fabricating and installing these signs shall be borne by the sign applicant. If approved by TxDOT, TxDOT may require DB Contractor to fabricate and/or install these signs as a TxDOT-Directed Change.

The company currently under contract with TxDOT for logo signs is Lone Star Logos, whose phone number is (866) 627-5646.

16.3.7 Sign Support Structures

DB Contractor shall determine foundation types and design sign foundations based upon geotechnical surveys/tests using Good Industry Practices. Designs for sign supports shall also comply with requirements in Sections 13 (Structures) and 15 (Aesthetics and Landscaping). The overhead sign support structures shall be galvanized steel monotube and designed in accordance with the Authority standards listed in Section 1.5.1.8 of the Technical Provisions.

DB Contractor shall design sign support structures to provide a vertical clearance of not less than 19 feet - 6 inches between the roadway and the bottom of the sign.

16.3.8 Pavement Marking

DB Contractor shall ensure that the design and installation of all pavement markings comply with applicable TMUTCD requirements and Authority standards.

DB Contractor shall mark median noses of all raised islands and inside edges of exclusive turn lanes (channelized curbs) in accordance with the requirements of TMUTCD and Authority standards.

DB Contractor shall use contrast markings for broken reflectorized pavement markings on the controlled access lanes. Contrast pavement markings shall be used on concrete pavement surfaces only. Contrast markings consist of black background in combination with standard TMUTCD marking colors.

Reflectorized pavement markings shall meet the retroreflectivity requirements described in TxDOT Special Specification 8251.

DB Contractor shall use 6 inch broken reflectorized pavement markings on frontage road lanes and mainlanes. All other broken reflectorized pavement markings shall be 4 inches. DB Contractor shall install wrong way arrows on all exit ramps and refer to the Authority's standard detail MRK-001-2004 for design requirements.

Reflectorized profile pavement markings shall be utilized on mainlane edge lines as required by TMUTCD and Authority standards.

16.3.9 Signalization

Traffic signal designs and modifications along the SH 360 frontage roads shall be completed in accordance with the current TxDOT standards and specifications, the TMUTCD, and the requirements of the applicable local Governmental Entities. The Cities of Grand Prairie and Mansfield currently maintain and operate the signals on the SH 360 frontage roads.

16.3.9.1 Traffic Signal Requirements

DB Contractor shall design and install fully-actuated permanent traffic signals at all TxDOT-authorized intersections within Project limits. In addition, DB Contractor shall modify, as appropriate, any existing traffic signals impacted by the Final Design. A list of the existing and proposed traffic signals is provided below in Table 16-1.

DB Contractor shall coordinate with TxDOT and the appropriate Governmental Entities to define appropriate traffic signal design requirements, local agency oversight of DB Contractor's Work, and final acceptance of traffic signals. DB Contractor shall coordinate with the appropriate Governmental Entities for synchronization of traffic signal networks. Existing signal agreements between TxDOT and the Cities of Mansfield and Grand Prairie are contained in Attachment 5-1 (Municipal Maintenance Agreement Operation and Maintenance of Traffic Signals). DB Contractor shall submit signal plans and specifications to the appropriate Governmental Entity for its review and consent.

New and/or modified traffic signal equipment and installation shall conform to the local Governmental Entity standards and requirements.

Temporary and permanent traffic signal plans shall be reviewed and approved by TxDOT and the applicable local Governmental Entity prior to installation of the traffic signals. DB Contractor shall purchase and install traffic signal equipment that is compatible with the approved equipment and systems of the applicable local Governmental Entity.

At newly constructed intersections, DB Contractor shall design and install the traffic signals as warranted and authorized, including controller cabinets, controller cabinet assemblies, and other necessary signal equipment to satisfy the appropriate Governmental Entity.

At reconstructed intersections, DB Contractor shall assess the adequacy of existing traffic and pedestrian signals and upgrade as needed to accommodate intersection and overall Project improvements, including any controller cabinets, controller cabinet assemblies, and other necessary signal equipment to satisfy the appropriate Governmental Entity.

At intersections which will be re-used or undergo only minor rehabilitation, DB Contractor shall review the existing traffic and pedestrian signal timing and coordinate with TxDOT and appropriate Governmental Entities in accordance with any existing or new municipal maintenance agreements and adjust timing where applicable and as needed to accommodate traffic flows impacted by the Project.

DB Contractor shall provide both pedestrian and vehicle detectors at all traffic signals within the Project. Radar presence detection devices and radar advance detection devices shall be provided for advance detection at traffic signals with approach speeds equal to or greater than 45 MPH.

Site and signals shall comply with TxDOT's *Accessible Pedestrian Signal (APS) Guidelines*.

DB Contractor shall purchase and install traffic signals, as well as controller cabinets, controller cabinet assemblies, and other signal equipment that meet the requirements of the appropriate Governmental Entity listed in Table 16-1.To effectively meet the Governmental Entity traffic signal requirements as well as the requirements for controller cabinets, controller cabinet assemblies, and other signal equipment. DB Contractor may consider purchasing signal equipment using contracts that the local Governmental Entities have with signal vendors.

Table 16-1: Existing/Proposed Traffic Signal Systems

Segment	Cross Street	Type	Governmental Entity (Owner)
SH 360 NBFR	E. Sublett Road/Camp Wisdom Road	Modified/Re-used	Grand Prairie
SH 360 SBFR	E. Sublett Road/Camp Wisdom Road	Modified/Re-used	
SH 360 NBFR	Lynn Creek Parkway/Webb Lynn Road	Modified/Re-used	Grand Prairie
SH 360 SBFR	Lynn Creek Parkway/Webb Lynn Road	Modified/Re-used	
SH 360 NBFR	New York Avenue	Modified/Re-used	Grand Prairie
SH 360 SBFR	New York Avenue	Modified/Re-used	
SH 360 NBFR	Ragland Road/Debbie Lane	Modified/Re-used	Grand Prairie
SH 360 SBFR	Ragland Road/Debbie Lane	Modified/Re-used	
SH 360 NBFR	Holland Road	Modified/Re-used	Mansfield
SH 360 SBFR	Holland Road	Modified/Re-used	
SH 360 NBFR	E. Broad Street	Modified/Re-used	Mansfield
SH 360 SBFR	E. Broad Street	Modified/Re-used	
SH 360 NBFR	Heritage Parkway	New	Mansfield
SH 360 SBFR	Heritage Parkway	New	
SH 360 NBFR	Lone Star Road	New	Mansfield
SH 360 SBFR	Lone Star Road	New	
SH 360 NBFR	Proposed SH 360 Frontage Road connection at WB US 287	New	Mansfield
SH 360 SBFR	Existing SH 360 Frontage Road connection at WB US 287	Modified/Re-used	Mansfield
SH 360 SBFR	Existing SH 360 Frontage Road connection at EB US 287	Modified/Re-used	Mansfield

DB Contractor shall remove and salvage all existing traffic signal equipment within the Project Site that is not being either modified or re-used as specified in Table 16-1. The salvaged equipment shall be delivered to the appropriate Governmental Entity or TxDOT facility. DB Contractor shall contact the appropriate shop supervisor in advance to make delivery arrangements.

DB Contractor is responsible for preparing traffic signal agreements (or supplements thereto) for execution by TxDOT and the appropriate Governmental Entity having operation and/or maintenance responsibilities. DB Contractor shall be responsible for the operations, maintenance, and cost of power for all traffic signal systems for the term of the DBA, unless stated otherwise in agreements with Governmental Entities.

16.3.9.2 Traffic Signal Timing Plans

DB Contractor shall design signal timing plans for all new and modified traffic signals and shall submit to TxDOT for review. DB Contractor shall coordinate and implement signal timing plans that optimize traffic flows and provide signal coordination with adjacent intersections and arterials for all existing and new traffic signals, modified signals, and interconnected signals. Unless timing maintenance is otherwise provided by a Governmental Entity, DB Contractor shall be responsible for updating signal timing as necessary to maintain optimized flow. Signal timing and phasing plans at diamond interchanges shall conform to the coordinated signal phasing and timing of the corridor.

DB Contractor shall provide copies of all final implemented signal timing plans to TxDOT and the applicable local Governmental Entity.

16.3.9.3 Traffic Signal Warrants

As part of the Final Design process, DB Contractor shall collect traffic data and prepare traffic warrant studies for intersections that are not signalized at the time of NTP1 and shall submit these signal warrant studies to TxDOT for review. The warrant studies shall address all signal warrant criteria in the TMUTCD and TxDOT's Traffic Manual. DB Contractor shall make recommendations for signal installations based on these warrant studies in consultation with TxDOT and the applicable local Governmental Entity. TxDOT will determine if a new signal or signal modification is required, based upon the warrant study.

All requests for additional new traffic signals from Governmental Entities and third parties within the Project ROW throughout the Term of the DBA, shall be subject to TxDOT approval. Requests for signals shall include supporting traffic warrant studies and traffic signal plans prepared in accordance with TxDOT standards.

Signal warrant studies shall be based on actual traffic and/or opening year traffic volumes. If actual traffic volumes are not available, but opening year traffic volumes are available, DB Contractor shall use the procedure in Section 3.5 of the TxDOT Traffic Signals Manual to determine the volumes to be analyzed. If opening year traffic volumes are not available, opening year traffic volumes shall be calculated by applying a 50-percent reduction to the 2050 design year traffic projections provided on the Base Scope Schematic. If additional signals or modifications to existing signals are warranted based on the traffic volumes obtained through these studies, DB Contractor shall be responsible for installation of additional traffic signals or modification of previously installed signals. If, based on the above traffic counts, the need for a signal or signal modification is unclear, TxDOT will reasonably determine if the new signal or signal modification is required. If a signal modification is performed then the same modification shall be made to the corresponding cross street intersection signal. In addition, if a frontage road intersection with a cross street is warranted to be signalized, then both frontage road intersections with that cross street shall be signalized.

16.3.9.4 Traffic Signal Support Structures

DB Contractor shall coordinate with TxDOT and the appropriate Governmental Entities to determine the appropriate type of traffic signal support structures that will be required. DB Contractor shall obtain the maintaining Governmental Entities' approval of traffic signal support structures to be used on new or modified signal installations.

16.3.9.5 Traffic Signal Systems

DB Contractor shall provide interconnection systems between new or modified signals within the Project limits and any other signal system within one-half mile of the Project as required by TxDOT or the appropriate Governmental Entity. DB Contractor shall make existing signal systems compatible with the proposed interconnections. DB Contractor shall ensure continuous communication with the traffic signal system within the Project limits and shall provide all communication hardware/equipment for TxDOT or the appropriate Governmental Entity to communicate with the signal systems within the Project Site. DB Contractor shall install signal infrastructure including, but not limited to, poles, mast arms, conduit and ground boxes that accommodate the ultimate build-out of the intersections as shown on the Ultimate Schematic.

DB Contractor shall provide to TxDOT, as part of the Final Design Documents, an acceptance test plan (ATP) for all traffic signals. This ATP shall also be submitted to the appropriate Governmental Entity. DB Contractor shall conduct testing in accordance with the ATP and document those results to show conformance.

16.3.10 Lighting

DB Contractor shall provide safety lighting at ramps and intersections including surface lighting and underpass lighting at cross streets. DB Contractor shall design the lighting system to minimize or eliminate illumination of areas outside the Project ROW.

DB Contractor shall prepare lighting studies that consider illumination levels, uniformity, and sources for the roadways, interchanges, and special areas. DB Contractor shall ensure that all AASHTO Minimum Illuminance Values and Illuminance Uniformity Ratios are met All light lost factors used in lighting analysis shall be stated for light-emitting diode (LED) and high mast High Pressure Sodium (HPS). DB Contractor shall maintain an average horizontal luminance on the roadways as described below. DB Contractor shall provide the photometric data results for all lighted areas within the Project limits to TxDOT for review.

DB Contractor's design shall incorporate the following Authority standards for lighting:

- Roadway Illumination Detail Steel Poles: RID-203-2011
- Roadway Illumination Detail Underpass Mounting: RID-204-2011
- Bridge Lighting Details: BLD- 201-2011

DB Contractor is responsible for preparing lighting agreements (or supplements thereto) for execution by TxDOT and the appropriate Governmental Entity having operation and/or maintenance responsibilities. An illumination agreement currently exists between TxDOT and the City of Mansfield and is contained in Attachment 5-2 (Municipal Maintenance Agreements for Highway Lighting). DB Contractor shall submit illumination plans and specifications to the appropriate Governmental Entity for its review and consent.

All third-party requests for lighting within the Project Site shall be subject to TxDOT approval.

DB Contractor shall design the lighting system to minimize or eliminate illumination of areas outside the Project ROW. DB Contractor shall design safety lighting systems in accordance with Chapters 5, 6, 7, and 9 of the TxDOT *Highway Illumination Manual*. To the extent of any conflict in the requirements between the TxDOT Highway Design Manual and the Authority's Roadway Electrical System Manual (RESM), the Authority requirements shall control. At all times during the Term of the DBA Documents, DB Contractor shall maintain safe lighting conditions.

Luminaire poles and breakaway bases shall be designed in accordance with AASHTO's *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. For all poles

located within the clear zone of the roadways, DB Contractor's design shall incorporate breakaway devices that are pre-qualified by TxDOT.

DB Contractor shall place all understructure lighting in a configuration that minimizes the need for lane closures during maintenance.

DB Contractor shall determine and design appropriate foundation types and lengths for permanent lighting structures.

DB Contractor shall not place ITS cable, fiber-optic lines, signal conductors, or any other non-lighting related cables or conductors in the lighting conduit, ground boxes, or junction boxes.

DB Contractor shall minimize the potential hazards of lighting poles through the careful consideration of mounting options and pole placements, including the following options:

- Placing pole bases on existing or proposed concrete traffic barrier; and
- Placing poles behind existing or proposed concrete traffic barrier or metal beam fence.

DB Contractor shall ensure that lighting structures comply with the Federal Aviation Agency (FAA) height restrictions near airport facilities. In the event that proposed or existing luminaires, mast arms, or poles infringe into an airport's or heliport's base surface, DB Contractor shall coordinate with the FAA and TxDOT to permit or relocate such structures. If FAA restrictions prohibit lighting structures from being placed in certain areas near an airport facility, DB Contractor shall find alternative ways of providing the required level of lighting.

DB Contractor shall coordinate with the appropriate electric power provider to establish locations for all power service drops.

All new and relocated illumination assemblies shall incorporate LED luminaires. The LED assembly and luminaires shall meet TxDOT Special Specification 8777. All new illumination shall operate at 480V line voltages.

If new underpass lighting is provided across an entire bridge, use the following specification for 150 Watt lighting units:

a) Housing. Aluminum housing with integral, weather-tight LED driver compartments and high performance aluminum heatsinks specifically designed for LED lighting application.

b) Bug/debris resistant LED and Optical Assembly. Illuminating Engineering Society of North America (IESNA) Type II Short Distribution. 4300K Color Temperature (derating is acceptable).

c) Ratings. UL listed, suitable for wet locations.

d) Mounting. See RID(UP), compatible with Underpass Light Fixture Type 1 and Type 2 mounting shaft.

e) Electrical. 480V 50/60 Hz universal electronic driver. Integral surge protection per IEEE/ANSI C62.41.

16.3.10.1 Additional Requirements

Additional requirements are as follows:

- At a minimum, underground conduit in interchange areas or temporary detours shall not be less than 2 inches Schedule 80 polyvinyl chloride (PVC); all other underground conduit installations shall not be less than 2 inches Schedule 40 PVC;
- The minimum conductor size shall be #8 AWG copper. DB Contractor shall not use duct cable for illumination purposes;

- The bridge lighting brackets abutment and bent spacing shall follow the latest bridge lighting standards; however, in special circumstances, the bridge lighting brackets may be placed a maximum of 20 feet from abutments and piers;
- If overhead electric lines confine the placement of luminaires, DB Contractor may use special davit-arm luminaires;
- Minimum inside dimensions for ground boxes shall be 15.25 inches (width) by 28.25 inches (length) by 10 inches (depth);
- Ground box covers shall be 2-inch-thick (nominal), non-conducting material and labeled "Danger High Voltage Illumination";
- Riprap aprons shall be provided to ground boxes located in grassy areas;
- Lights shall have an identification tag denoting a contact person or office in case of emergency or for maintenance, and the address and telephone number;
- Electrical part of the installation shall be designed and installed in conformance with the National Electrical Code (NEC);
- An illumination security plan which includes requirement for securing access covers and ground boxes shall be developed and submitted to TxDOT for approval;
- Concrete riprap aprons shall be placed at all lighting foundations

16.3.11 Visual Quality

Notwithstanding the requirements of Section 16.3.10 (Lighting), DB Contractor shall make a reasonable attempt to provide luminaires of equal height along the roadway.

DB Contractor shall not use timber poles for permanent installation.

DB Contractor shall re-sod or re-seed areas of construction disturbed by the installation of signs or lighting systems after final installation.

16.4 Construction Requirements

16.4.1 Permanent Signing and Delineation

DB Contractor shall use established industry and utility safety practices to erect and remove signs located near any overhead or underground Utilities, and shall consult with the appropriate Utility Owner(s) prior to beginning such Work. DB Contractor shall stake each sign location in the field and provide TxDOT 72 hours notice prior to installation of any sign.

DB Contractor shall leave all applicable advance guide signs and/or exit direction signs in place at all times, and shall not obstruct the view of the signs to the motorist. DB Contractor shall replace any other removed signs before the end of the work day.

DB Contractor shall affix a sign identification decal to the back of all signs for inventory purposes and shall submit inventory information to TxDOT in a TxDOT-compatible format.

All installed signs are required to meet the minimum retro-reflectivity values specified in Table 16-2 (Minimum Maintained Retroreflectivity Levels).

Table 16-2: Minimum Maintained Retroreflectivity Levels

Sign Colors	Sheeting Type (ASTM D4956-04)				Additional Criteria
	I	II	III	VII, VIII, IX	
White on Green	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W≥ 250; G≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120; G ≥ 15			Ground-mounted
Black on Orange or Black on Yellow	Y*; O*	W ≥ 50; G ≥ 50			See Note 1
	Y*; O*	W ≥ 75; G ≥ 75			See Note 2
White on Red	W ≥ 35; R ≥ 7				See Note 3
Black on White	W ≥ 50				—

Notes:

The minimum maintained retro-reflectivity levels shown in this table are in units of candelas per lux per square meter (cd/lx/m^2), measured at an observation angle of 0.2° and an entrance angle of -4.0°.

1 For text and fine symbol signs measuring at least 1200 millimeters (mm) (48 inches) and for all sizes of bold symbol signs

2 For text and fine symbol signs measuring less than 1200 mm (48 inches)

3 Minimum Sign Contrast Ratio _ 3:1 (white retroreflectivity ÷ red retroreflectivity)

* This sheeting type should not be used for this color for this application.

Bold Symbol Signs

W1-1, -2 – Turn and Curve
W1-3, -4 – Reverse Turn and Curve
W1-5 – Winding Road
W1-6, -7 – Large Arrow
W1-8 – Chevron
W1-10 – Intersection in Curve
W1-11 – Hairpin Curve
W1-15 – 270 Degree Loop
W2-1 – Cross Road
W2-2, -3 – Side Road
W2-4, -5 – T and Y Intersection
W2-6 – Circular Intersection
W3-1 – Stop Ahead
W3-2 – Yield Ahead
W3-3 – Signal Ahead
W4-1 – Merge
W4-2 – Lane Ends
W4-3 – Added Lane
W4-5 – Entering Roadway Merge
W4-6 – Entering Roadway Added Lane
W6-1, -2 – Divided Highway Plaques Begins and Ends
W6-3 – Two-Way Traffic
W10-1, -2, -3, -4, -11, -12 – Highway-Railroad Advance
W11-2 – Pedestrian Crossing
W11-3 – Deer Crossing
W11-4 – Cattle Crossing
W11-5 – Farm Equipment
W11-6 – Snowmobile Crossing
W11-7 – Equestrian Crossing
W11-8 – Fire Station
W11-10 – Truck Crossing
W12-1 – Double Arrow
W16-5p, -6p, -7p – Pointing Arrow Plaques
W20-7a – Flagger
W21-1a – Worker

Fine Symbol Signs – Symbol signs not listed as Bold Symbol Signs.

Special Cases

W3-1–Stop Ahead: Red retroreflectivity, 7

W3-2–Yield Ahead: Red retroreflectivity, 7, White retroreflectivity, 35

W3-3–Signal Ahead: Red retroreflectivity, 7, Green retroreflectivity, 7

W3-5–Speed Reduction: White retroreflectivity,_50

For non-diamond-shaped signs such as W14-3 (No Passing Zone), W4-4p (Cross Traffic Does Not Stop), and W13-1, -2, -3, -5 (Speed Advisory Plaques), use largest sign dimension to determine proper minimum retroreflectivity level.

16.4.2 Permanent Pavement Marking

DB Contractor shall meet the following minimum retroreflectivity values for edge line markings, centerline/no passing barrier line markings, and lane line markings when measured any time after three (3) days but not later than ten (10) days after application:

- Type I, Thermoplastic, Pavement Markings:
  a. White markings: 250 millicandelas per square meter per lux (mcd/m2/lx); and

b. Yellow markings: 175 mcd/m2/lx.

- Type II, Paint & Beads, Pavement Markings:
  a. White markings: 175 mcd/m2/lx; and
  b. Yellow markings: 125 mcd/m2/lx.

16.4.3 Permanent Signalization

DB Contractor shall coordinate with the Utility Owner(s) and ensure necessary power service is initiated and maintained for permanent signal systems. DB Contractor shall ensure power is provided to all DB Contractor-installed signals.

DB Contractor shall provide TxDOT with copies of all signal warrant studies as required in this Section 16 (Signing, Delineation, Pavement Marking, Signalization, and Lighting). DB Contractor shall also provide copies of all final signal timing plans to TxDOT and the applicable local Governmental Entity.

Before placing any permanent traffic signal equipment, DB Contractor shall provide TxDOT a layout indicating the proposed location of such items. DB Contractor shall stake each pole location in the field and provide TxDOT 72 hours notice prior to installation of any foundation

16.4.4 Lighting

DB Contractor shall coordinate with the Utility Owner(s) and ensure power service is initiated and maintained for permanent and temporary lighting systems. During construction, DB Contractor shall maintain all existing lighting as temporary lighting and restore or replace any lighting that is impacted prior to Substantial Completion. At all times during the Term, safe lighting conditions shall be maintained along the Project roadway. DB Contractor shall stake each pole location in the field and provide TxDOT 72 hours notice prior to installation of any foundation.

DB Contractor shall remove all old illumination-related cable and conduit that does not have existing pavement or riprap above it; any existing illumination-related cable and conduit that is under the existing pavement; or riprap may be abandoned.

DB Contractor shall place all bore pits safely away from traffic, provide positive barrier protection, and provide necessary signs to warn of the construction area.

DB Contractor shall contact Utility Owners regarding their specific required working clearance requirements.

DB Contractor shall affix an identification decal on each luminaire, ground box, and electrical service maintained and/or operated by DB Contractor for inventory purposes and shall submit inventory information to TxDOT in a TxDOT-compatible format. This identification shall denote that these are property of DB Contractor and shall provide a contact phone number and address in the event of Emergency or necessary maintenance.

17 INTELLIGENT TRANSPORTATION SYSTEMS

17.1 General Requirements

An Intelligent Transportation System (ITS) is necessary for monitoring the Project's traffic flow and performance both during construction and as a permanent installation. The Project ITS must accurately detect traffic and traffic operational conditions throughout the Project Limits, and clearly communicate relevant and useful travel information in real time to the Users.

The Project ITS shall be installed in accordance with TxDOT and the Authority's standards and specifications. The ITS must be compatible with adjacent system(s) that TxDOT, the Authority, and other agencies, including DB Contractors, are currently operating. DB Contractor shall coordinate the ITS planning and implementation with TxDOT and other Governmental Entities that have roadways intersecting the Project.

DB Contractor shall maintain and protect the use of the existing ITS functionality within the Project at all times, except for system crossovers that are approved by TxDOT. Upon Substantial Completion, the Authority will perform all ITS/traffic management and safety operations and maintenance of equipment for these operations in a manner consistent with the Authority policies and procedures.

The functionality of the ITS shall be such that command and control of appropriate field devices is shared and exchanged with appropriate Governmental Entities including, but not limited to, providing TxDOT with viewing access to any vehicle detection systems place on and data/video generated from the Project mainlanes and frontage roads.

DB Contractor shall be responsible for the planning, design, and installation of safe and functional ITS for the Project using Good Industry Practice. All components of the ITS shall conform to the provisions of the National Transportation Communication for ITS Protocol (NTCIP).

The Project ITS shall operate under the North Texas Regional Comprehensive ITS Program. Communication and interoperability shall be achieved with the Authority's Command center, such that with appropriate privileges, access to data, command, control and information sharing can occur. All communication and access of information shall occur in near real-time (within logistical restraints).

17.2 Design Requirements

DB Contractor shall provide a complete and operational ITS network throughout the Project that (i) is expandable as capacity is increased along the Project roadways, (ii) utilizes hardware and software components consistent and compatible with TxDOT and the Authority in the manner described in this Section 17.2 (Design Requirements) and the other affected Governmental Entities, (iii) is resistant to weather encountered in the Project area, and (iv) places components in locations that are not hazardous to the public. Prior to beginning ITS and toll design efforts, the DB Contractor shall conduct an ITS and toll design workshop with TxDOT, the Authority, the toll system integrator, the responsible entity for adjacent roadway ITS operations, and affected Governmental Entities (per TxDOT's direction) to confirm the Authority's operational requirements, review the DB Contractor's survey of existing ITS infrastructure and condition assessment, discuss concepts, identify potential resolutions for site-specific issues (as identified by the DB Contractor, TxDOT and the Authority), determine requirements for construction and coordination of activities with adjacent roadways, and confirm requirements of other affected parties and Governmental Entities. DB Contractor shall prepare a preliminary ITS layout for review and approval by TxDOT and the Authority to ensure adequate planning of the ITS implementation.

Subject to the specific requirements of this Section 17 (Intelligent Transportation Systems), DB Contractor shall determine the number and specific locations of all ITS components.

DB Contractor shall provide safe ingress/egress areas and structures to accommodate authorized personnel access to ITS components for the installation of the ITS and communication system components. Unless approved by TxDOT, ITS components shall be placed in locations that allow maintenance from the mainlanes shoulder or frontage roads.

DB Contractor shall provide cross section at all ITS devices and indicate duct bank locations in roadway cross sections.

All components of the ITS shall conform to the provisions of the National Transportation Communication for ITS Protocol (NTCIP) and be compatible with the latest operating system being used by TxDOT and the Authority.

All ITS devices and associated mountings shall meet the 100 mph wind load design standards.

The installed ITS Equipment shall provide TxDOT and the Authority (as applicable) access to accurate and reliable data and quality video images and accurate control of field devices from the Authority Command Center on a real-time basis 24 hours a day, 7 days a week. Real-time is defined as correct data being available at the Traffic Management Center within 30 seconds of being processed or the correct response of a field component within 1 millisecond of the command being sent.

DB Contractor shall be responsible for ensuring the CCTV, DMS, and vehicle detection systems meet the reliability requirements specified in the most current TxDOT statewide and/or Authority specifications, as well as any standard publications provided by TxDOT and/or the Authority at the time of actual design work.

The design and construction requirements, together with the design criteria presented in the most current TxDOT statewide and Authority specifications, as well as any standard publications provided by TxDOT at the time of the actual design work, define the minimum standards and scope that must be met by the DB Contractor. Any recommended modifications to the specifications shall be presented by the DB Contractor at the ITS and toll design workshop and shall be subject to TxDOT and Authority approval.

The DB Contractor is responsible for designing and constructing lightning protection, grounding and surge suppression for each ITS structure and equipment cabinet. Ground mounted equipment cabinets next to ITS support structures will be constructed in accordance with Authority standards and specifications.

The DB Contractor shall be responsible for the design, installation and access to power required to operate the ITS devices, including all utility costs, until Substantial Completion of the Project and Project Final Acceptance by TxDOT, at which time the utilities will be transferred to the Authority.

17.2.1 ITS Communications Requirements

DB Contractor shall provide an Ethernet based communications network that has redundant routing capabilities. The communications network shall serve the highway ITS and tolling components along the highway Elements of the Project.

DB Contractor shall design and construct a fiber optic infrastructure which includes duct banks, conduit, junction boxes, and equipment slabs based on Authority and TxDOT specifications and plans shown in the RID. Where necessary, as determined during design and approved by TxDOT and the Authority, DB Contractor shall provide communication node buildings and cabinets to support the communications network. Infrastructure for security lighting, cameras and access control at all buildings, communication huts, gantries and other corridor facilities in accordance with Authority standards and specifications shall be provided by the DB Contractor.

DB Contractor shall be required to connect proposed new fiber optic cabling and associated conduit and duct bank infrastructure to existing duct banks as required to meet the specifications herein. DB Contractor shall pull all the fiber to the existing connection points, regardless of whether or not the connection points lay within the defined Project limits.

DB Contractor shall be responsible for providing, installing, splicing, testing, and connecting all fiber optic cables, including splice cases, patch panels and incidental materials, fiber optic markers and test stations for all ITS and tolling equipment.

Construction of fiber optic cable shall be dedicated to the operation of the Project and shall not be comingled with other roadway systems. The Project fiber optic infrastructure system provisioned for the Authority shall be tied back to the PGBT-WE fiber backbone at SH 161 and IH 20 and connectivity shall be established with the existing Authority network as needed to provide connectivity to the Authority Traffic Management Center and tolling systems. The Project fiber optic infrastructure system provisioned for TxDOT shall be terminated at the existing TxDOT Satellite building located near the north-east corner of the intersection of Cummins Road and the SH 360 southbound frontage road. Fiber backbone shall be constructed in accordance with Authority design standards and specifications from US 287 to IH 20 with connection to the Authority's fiber backbone system at SH 161 (President George Bush Turnpike – Western Extention) accommodated using TxDOT's ITS system along IH20 between SH 360 and SH 161. DB Contractor shall specify the endpoints for fiber connections and shall refer to Attachment 17-1 - Toll Facility Fiber Optic Cable Connection Details, for further details regarding final design of the ITS system. DB Contractor shall coordinate final design with TxDOT and the Authority prior to construction. Final design of the ITS system shall be subject to TxDOT approval.

DB Contractor shall install two 4" MDC conduit systems with innerducts and ground boxes the entire length of the Project and from the project limits to existing ductbank on IH 20 to accommodate fiber optic connectivity. The maximum number of Layer 2 field network switches forming a network path between an end device (TxDOT ITS) and a satellite building based data aggregating Layer 3 network switch shall not exceed 12. The calculated data throughput assigned to any sub-network path shall not exceed 50% of the path's throughput capacity. Calculations for bandwidth usage shall be provided during the preliminary design efforts.

The DB Contractor shall install 144 strands of single mode hub to hub fiber optic cable in one 4" multiduct conduit system in accordance with NTTA standards and specifications between satellite buildings to connect to ITS devices and tolling zones, plus another 48 strands of single mode fiber between satellite buildings as the trunkline fiber spare fibers in a separate 4" multiduct conduit system. No splicing of the trunkline spare fiber is allowed unless approved by TxDOT. Pull boxes shall be spaced at each ITS device location, Toll Zone, signal cabinet, satellite building and a maximum of every 1500' along the Project corridor. The DB Contractor is responsible for confirming that 144 strands of fiber can support the proposed ITS and tolling system deployment.

The DB Contractor shall provide, install and test single mode fiber for ITS and toll systems communications in accordance with TxDOT and Authority standards and specifications.. Fiber shall be placed in a dedicated vault in the duct banks along the corridor and shall consist of twelve (12) strands for each Toll Zone. All fiber, conduit and ground boxes for the toll systems within the toll zone shall be separate from those used for ITS and shall be exclusive to the toll systems. Fiber strands for ITS devices which will be connected to the tolling communication network shall adhere to the general ITS communication network requirements identified above.

The DB Contractor shall provide terminal servers, video encoders, ethernet switches, and media converters and modems to establish communications as required to establish a complete ITS and tolling system. Video encoding shall meet Moving Picture Experts Group (MPEG)-4 standards and be compatible with the Authority's Command Center software requirements for CCTV.

The Authority will provide network switches at all tolling sites. The DB Contractor shall provide all other network switches as needed to provide required network functionality, including but not limited to switches located at hubs, CCTV locations, DMS locations, and vehicle detection sites. The Authority will provide final network switch configuration and perform final network commissioning activities with the DB Contractor's assistance as required. The DB Contractor shall perform all local connectivity tests and burn in activities and establish milestones within the DB Contractor's schedule indicating network readiness for the Authority's final configuration and commissioning activities.

The network switches provided by the DB Contractor shall be Cisco IE-3000-4TC, PWR-IE65W-PC-AC=, IEM-3000-4PC=, PWR-IE50W-AC-IEC=, GLC-LX-SM-RGD= or approved equal. All Cisco equipment provided by the DB Contractor shall be purchased with five years of Cisco Smartnet warranty and maintenance service.

The uninterupptible power supply provided at all network locations shall be the Falcon SSG Series 1500 or approved equal.

The DB Contractor shall provide, integrate, test, and commission a separate network dedicated to the CCTV cameras place at cross streets as described in Section 17.2.3.

17.2.2 Conduit

DB Contractor shall provide in accordance with TxDOT and Authority standards and specifications , the type, quantity, and design of the conduit above and below ground, ground boxes, and all communication cable and electrical conductors to support the ITS and tolling network and operations. No exposed conduit sections will be permitted. All sections shall have a minimum of 48" of cover over all ITS conduit except where boring is required to cross under intersections or to reach locations within the travel lanes or on the opposite side of the travel lanes, or in the case of large bridge crossings, built into the bridge structure, unless approved by TxDOT during preliminary design efforts. The DB Contractor shall provide separate conduits for tolling and toll-related ITS communication, tolling and toll-related ITS power, general ITS communication and general ITS power. Two spare 3" schedule 40 conduits for future expansion shall be provided.

Four (4) 1.25" high-density polyethylene (HDPE) innerducts with SDR-11 rating shall be installed along the length of corridor and branched to toll collection facilities, DMS, radio and CCTV sites in accordance with Authority standards and specifications.

Four (4) 1.25" high-density polyethylene (HDPE) innerducts shall be installed along the length of the corridor for the exclusive use of TxDOT.

All ground boxes shall be placed at a 1500' maximum spacing and junction boxes placed under bridges. Pull tape shall be installed in conduits with a tensile rating of at least 1200 lbs.

DB Contractor shall maintain adequate separation between proposed conduits and any existing TxDOT installations for construction, maintenance, and repair such that installation and subsequent maintenance activities will not impede maintenance or access to existing installations.

The DB Contractor shall provide materials and use construction methodology in conformance at a minimum with the most current or applicable TxDOT statewide and/or Authority specifications, including placement of a trace wire within the conduit, providing the required 48" or more of cover, placing locator tape and installing above ground markers and test stations.

17.2.3 CCTV Cameras

DB Contractor shall place CCTV cameras for Incident verification, traffic management and construction management at a maximum 1/2-mile spacing in accordance with Authority standards. CCTV placement shall be coordinated with location of overhead sign structures and other structures such as overpasses and

underpasses. The system of cameras shall accurately identify all vehicle(s) involved in an Incident or Emergency, the extent of vehicle(s) damage, and if applicable, the likelihood of personal injury. Operation of the cameras shall result in no visual delay in response of the camera pan/tilt/zoom by a User. DB Contractor shall illustrate viewing angles and occlusions from proposed and existing signing on proposed plan and profiles plans. DB Contractor shall coordinate final camera aiming and limits of individual camera coverage with the Authority.

CCTV cameras shall be placed at all cross streets and at the Green Oaks / Kingswood Blvd – US 287 intersection for use by TxDOT. These cameras shall be treated as a separate system and shall be fully independent of the ITS solution provided for the Authority from a power and communications perspective. DB Contractor shall coordinate design of this separate camera solution with TxDOT. This camera system shall be compatible with the existing TxDOT solution and the applicable TxDOT Fort Worth District standards.

17.2.3.1 Equipment

DB Contractor shall provide all necessary CCTV equipment, including cameras, camera controls, cables, surge protection, grounding, and connections.

DB Contractor shall provide a digital video format and communications protocol at all connections with TxDOT systems. The format and protocol provided by DB Contractor shall be compatible with systems in use by the Authority.

17.2.3.2 Specifications

The CCTV cameras provided shall be the Axis model Q6042-E PTZ Dome Network Camera (for PTZ applications) or the Axis Q1602 Network Camera (for fixed field of view locations) or Authority approved equal. Fixed cameras shall be fitted with Theia lens.

DB Contractor shall provide cameras with built-in heaters, mounting structure, and related equipment capable of operating within the following weather conditions:

- Wind load of 100 mph without permanent damage to mechanical and electrical equipment
- Ambient temperature range of -35 degrees Fahrenheit to +140 degrees Fahrenheit
- Relative humidity range not to exceed 95 percent within the temperature range of +40 degrees Fahrenheit to +110 degrees Fahrenheit
- Humidity range of 0 to 100 percent condensing

17.2.3.3 Placement

DB Contractor shall provide overlapping roadway coverage by CCTV cameras for all highway lanes and intersection cross streets within the Project limits to provide redundant camera field of view. CCTV cameras shall be placed to enable the Authority and TxDOT to monitor traffic conditions on mainlanes, connecting facilities, and entrance and exit ramps, and messages displayed on any remotely-controlled dynamic message signs in the Project area. To provide a stable video image, DB Contractor shall mount cameras on dedicated structures in accordance with Authority standards and specifications unless otherwise approved by TxDOT.

Exact camera locations will be approved by the Authority and TxDOT prior to any CCTV structure construction.

Distance between CCTV cameras shall not exceed 0.5 miles unless approved by the Authority and TxDOT; however, the DB Contractor is responsible for placing cameras to ensure 100% coverage. 100% coverage shall be defined as no blind spots for any reason, including but not limited to: trees, bridge

structures, horizontal or vertical alignment, overhead or side mounted sign structures, or toll gantries. Additionally, each CCTV camera shall be able to view the CCTV camera immediately upstream and downstream from itself unless approved by the Authority and TxDOT.

17.2.4 Vehicle Detection

DB Contractor shall provide permanent high definition (HD) microwave detection capable of covering each highway lane of the Project that measures vehicle classification, vehicular volume, lane occupancy, and vehicle speed information on the roadway. The detectors shall be non-intrusive to the roadway Users. Spacing for the permanent vehicle detection shall, at a minimum, provide detection for all highway lanes at one location between interchanges. For sensors which are not placed in the pavement, the DB Contractor shall locate the devices on the side of the Project nearest the largest lane shoulder so as to limit the potential interference of the concrete traffic barrier on detecting vehicles and collecting information.

Vehicle detection sensors shall determine vehicle speed for each vehicle passing the sensor. The sensors shall provide raw speed data (volume, speed, lane occupancy and vehicle classification counts) and direction of travel for each vehicle detection sensor. Additionally, the sensors (or the software controlling the sensors) shall be capable of determining vehicles traveling in the wrong direction. For sensors that collect data across multiple lanes of traffic, data shall be collected and provided by lane. In areas where a sensor would have to collect data on more than twelve (12) lanes of traffic including shoulders or over distances greater than two hundred-fifty (250) feet, the DB Contractor shall provide detectors on each side of the Project. TxDOT and the Authority shall be able to adjust the frequency rates that the data files are provided by device.

DB Contractor may attach detection units to structures with prior concurrence from TxDOT. Where a structure is not available, or in lieu of attaching the detection unit to a structure, DB Contractor shall install a mounting pole solely for the vehicle detector. Any mounting poles placed specifically for ITS items shall conform to Authority specifications for CCTV mounting poles and must adhere to minimum vertical clearance requirements. DB Contractor shall provide all necessary support structures, equipment, including, but not limited to, vehicle detection system devices, controls, cables, and connections.

17.2.5 Portable Changeable Message Signs (PCMS)

DB Contractor shall provide, during the construction phase, six (6) electronic PCMS that can be remotely operated from the construction office. Location and placement shall be approved by TxDOT.

PCMS shall be used to inform motorists of the availability of alternate routes, and to advise travelers of adverse road conditions and congestion. PCMS shall be placed to provide a driver-friendly sign-viewing angle at each DMS location. DB Contractor shall position each PCMS to allow motorists to safely view the messages being displayed.

17.2.6 Lane Control Signals (LCS)

Not applicable.

17.2.7 Dynamic Message Signs (DMS)

Should TxDOT elect to exercise the option for the DB Contractor to install DMS for the Project, DB Contractor shall design and construct the foundations, structures, trusses, fiber optic network connection and communications switching, and conduit for the installation of four (4) LED technology electronic DMS. The specific location of the four DMS (and model specified in Section 17.2.7.1) will be finalized during design.

DB Contractor shall be responsible for providing, installing and connection of the DMS. DMS must be shown on signing layouts, plans and profiles to illustrate viewing angles and occlusions. DB Contractor shall coordinate all work with TxDOT to determine the type, quantity and design of the conduit and ground boxes required to support the ITS network and other operations.

17.2.7.1 Specifications

Two of the four DMS shall be the Skyline walk in dynamic message sign part number VMSLED -W-3-18F-27X125-IRX or approved equal, with 336S brown cabinet and 2070 controller.

Two of the four DMS shall be the Skyline part number VMSLED-W-3-18F-27X125-I ISC PC, or approved equal.

17.3 Construction Requirements

17.3.1 General

DB Contractor shall notify TxDOT and the Authority thirty (30) days in advance of making connections to the existing TxDOT or Authority system.

DB Contractor shall coordinate with Utility Owner(s) and ensure that power service is available for permanent ITS systems a minimum of 90 days prior to Substantial Completion.

DB Contractor shall complete ITS communication network installation and testing including installation of conduit, ground boxes, fiber optic cable and associated communication equipment to establish a complete ITS and tolling system, a minimum of 90 days prior to Substantial Completion.

17.3.2 Salvaging Existing Items

Not applicable.

17.3.3 Existing ITS Relocation

Existing ITS is currently located at the northwest and northeast corners of SH 360 and Camp Wisdom Road. A copy of an Advanced Funding Agreement for operation and maintenance of the ITS system by the City of Grand Prairie and construction plans showing the location of the two CCTV cameras are contained in the RID. DB Contractor shall verify exact location of the existing ITS and determine whether such ITS requires relocation.

17.3.4 ITS Implementation Plan

The Authority shall assume responsibility for the operations and maintenance of the ITS system upon Substantial Completion. TxDOT shall assume responsibility for the operations and maintenance of the camera system dedicated to crossings upon Substantial Completion. DB Contractor shall provide an ITS Implementation Plan to TxDOT and the Authority for review and approval as part of the Final Design Documents to demonstrate system interoperability with other ITS systems in the region as well as compatibility with the operational procedures for command and control of devices, sharing of data, and priority control that various parties will assume under different operating conditions of the corridor and surrounding roadway system. The ITS Implementation Plan shall include the following:

- Requirements Traceability Matrix;
- Functional design plan;
- Communications analysis report;
- Operational and requirements report; and
- Acceptance Test Plan (ATP).

The functional design plan shall show each device's relationship in the overall functional design of the ITS and proposed roadway system. This functional design plan shall include the location of devices, technology and functional specifications of devices and any unique design Elements that are necessary to achieve the desired functionality or space restrictions.

The communications analysis report shall document the communications design. This report shall show all ITS field devices, their flow through all communications mediums, and throughput within the ITS. This shall include communications between any involved Governmental Entities. The report shall contain a narrative describing the information to be transmitted, as well as a high level plan for its use. Communications diagrams shall be provided showing the location of any communication hubs (existing or proposed), any planned fibers (source as well as identification tag), modem/transceiver equipment planned at field equipment cabinets, and other equipment deemed necessary to functionally operate the ITS.

The operational and requirements report for the ITS shall describe the functional capability of the system and the method and level of integration. The document shall describe in detail the design of the system, hardware and software to be utilized, functional capabilities, command and control, data sharing capabilities and priority use of devices by multiple agencies. In developing the operational and requirements report, DB Contractor is required to hold scoping meetings with TxDOT such that requirements are defined to achieve interoperability with other ITS systems and priority logic and information for command and control and data sharing is created to enable effective management and incident response along the corridor as well as regionally.

For each component of the ITS, an ATP shall assure proper operation, control and response of each device meeting the functional requirements. DB Contractor shall implement the ATPs and provide certified documentation that its requirements have been met prior to operational use of the ITS.

As part of the ATP, DB Contractor shall prepare a system acceptance procedure prior to start of construction to assure proper operation, control and response of each device as part of the overall ITS, including the overall operating system and software. DB Contractor shall conduct the procedure and provide certification that the ITS effectively meets the required functional requirements. DB Contractor shall provide this certification prior to the use of the ITS for service.

17.3.5 Record Drawings and Documentation

The Record Drawings shall include the construction drawings as well as catalog sheets for all equipment and components. Record Drawings shall be maintained during design and construction and delivered as Final upon substantial completion.

For each component of the ITS, all computer codes and software shall be available to TxDOT.

18 TRAFFIC CONTROL

18.1 General Requirements

DB Contractor shall design and construct the Project, in conformance with the requirements stated in this Section 18 (Traffic Control), to provide for the safe and efficient movement of people, goods, and services, through and around the Project, while minimizing negative impacts to Users, residents, and businesses.

DB Contractor shall coordinate with local government entities and TxDOT on the development of the Traffic Management Plan (TMP). DB Contractor shall also participate in coordination meetings scheduled by others such as chamber of commerce or neighborhood associations. These meetings shall include Traffic Management Committee meetings convened by Texas Transportation Institute (TTI) and consisting of local representatives and stakeholders impacted by the Project.

It shall be the responsibility of DB Contractor to gain approval from the appropriate Governmental Entity or property owner on each intersecting street or driveway closure.

During all phases, temporary or existing ITS equipment, street lights, and traffic signals shall remain in operation such that the new and existing equipment operate as a coherent system.

18.2 Administrative Requirements

18.2.1 Traffic Management Plan

DB Contractor shall prepare and implement a Traffic Management Plan (TMP) that includes the following items:

- Descriptions of the qualifications and duties of the traffic engineering manager, traffic control coordinator, and other personnel with traffic control responsibilities;
- Procedures to identify and incorporate the needs of transit operators, Utility Owners, Governmental Entities, Emergency Service providers, school districts, business owners, and other related Users, Customer Groups or entities in the Project corridor and surrounding affected areas;
- Procedures for obtaining acceptance of temporary construction speed zones, detours, road and lane closures and other traffic pattern modifications from applicable Governmental Entities, and implementing and maintaining those modifications;
- Procedures for signing transitions during construction from one stage to the next and from interim to permanent signing;
- Procedures for maintenance and replacement of traffic control devices, including pavement markings and traffic barriers, if used, and transitions from one stage to the next and from interim to permanent placement;
- Procedures to regularly evaluate and modify, if necessary, traffic signal timings, and the procedures for the development, TxDOT approval, implementation, testing, and maintenance of all affected signals;
- Procedures to coordinate with the appropriate Governmental Entities operating signal networks along the Project or Project detour routes to ensure temporary system compatibility, establish responsibilities for temporary signal installation, maintenance, operation and removal, and coordinate traffic signal timing with local signal networks;

- Procedures and process for the safe ingress and egress of construction vehicles in the work zone including temporary construction exits to clean the construction vehicles off;
- Provisions to provide continuous access to established truck routes and Hazardous Material (HazMat) routes, and to provide suitable detour routes, including obtaining any approvals required by the appropriate Governmental Entities for these uses;
- Procedures to modify plans as needed to adapt to current Project circumstances including a contingency plan to alleviate unreasonable construction-related back-ups that can be implemented immediately upon notification from TxDOT;
- Procedures to communicate TMP information to DB Contractor's public information personnel and notify the public of maintenance of traffic issues in conjunction with the requirements of Section 3 (Public Information and Communications);
- Descriptions of contact methods, personnel available, and response times for any deficiencies or Emergency conditions requiring attention during off-hours;
- Procedures for night work (sundown to sun rise) to include a work zone light system design in accordance with NCHRP Report 498 – *Illumination Guidelines for Nighttime Highway Work;*
- DB Contractor shall notify the traveling public by placing changeable message signs a minimum of seven (7) Days in advance of actual roadway closure or major traffic modifications. Where available and when possible, DB Contractor shall coordinate and utilize Dynamic Message Signs on the regional ITS system; and
- DB Contractor shall utilize uniformed police officers to effect lane closures.
- Procedure for compliance with reporting height and width restrictions per Section 18.4.5

The TMP must be approved by TxDOT prior to the start of construction activities. DB Contractor shall provide TxDOT sufficient time for review of, and comment on, the TMP. TxDOT retains the right to require revision and re-submittal of the TMP within a reasonable amount of time.

If at any time, TxDOT, in its sole discretion, determines that construction-related back-ups become unreasonable, modifications to alleviate the congestion shall be taken immediately. The development and implementation of these contingency plans shall be at DB Contractor's expense.

18.3 Design Requirements

18.3.1 Traffic Control Plans

DB Contractor shall use the procedures in the TMP and the standards of the TMUTCD to develop detailed traffic control plans, which provide for all construction stages and phasing, as well as all required switching procedures.

DB Contractor shall produce a traffic control plan for each and every phase of Work that impacts traffic and involves traffic control details and shall coordinate with appropriate Governmental Entities on the development of the plan. DB Contractor is responsible for obtaining all necessary permits from such Governmental Entities to implement the plans.

Each traffic control plan shall be submitted to TxDOT for review a minimum of ten (10) Days prior to implementation. The traffic control plan shall include details for all detours, traffic control devices, striping, and signage applicable to each phase of construction. Information included in the traffic control plans shall be of sufficient detail to allow verification of design criteria and safety requirements, including typical sections, alignment, striping layout, drop off conditions, and temporary drainage. The traffic

control plans shall clearly designate all temporary reductions in speed limits. Changes to posted speed limits will not be allowed unless specific prior approval is granted by TxDOT.

Opposing traffic on a normally divided roadway shall be separated with appropriate traffic control devices in accordance with Good Industry Practice and TMUTCD, based on roadway design speed**.** Approved traffic control devices can be found in the *Compliant Work Zone Traffic Control Device List* (CWZTCD list).

To address edge conditions in the TCP, the DB Contractor shall provide appropriate warning device or traffic barrier as determined in the TxDOT standard "Worksheet for Edge Condition Treatment Types".

DB Contractor shall maintain signing continuity on all active roadways within or intersecting the Project at all times.

Throughout the duration of the Project, DB Contractor shall ensure all streets and intersections remain open to traffic to the greatest extent possible by constructing the Work in stages. DB Contractor shall maintain access to all adjacent streets and shall provide for ingress and egress to public and private properties at all times during the Project.

DB Contractor shall prepare public information notices, in accordance with Section 3 (Public Information and Communications), in advance of the implementation of any lane closures or traffic switches. These notices shall be referred to as Traffic Advisories.

Equally as important as the safety of the road Users travelling through the Project limits is the safety of pedestrians. DB Contractor must accommodate the needs of the pedestrians, including those with disabilities, when preparing the traffic control plans. The following considerations must be addressed when temporary pedestrian pathways within the Project limits are designed:

a. Provisions for continuity of accessible pedestrian paths should be incorporated into the traffic control plans;

b. A smooth, continuous hard surface should be provided throughout the entire length of the temporary pedestrian facility;

c. The geometry and alignment of the temporary facility shall comply with ADA requirements; and

d. Blocked routes, alternate crossings, and sign and signal information must be communicated to pedestrians.

18.3.1.1 Design Parameters for Traffic Control Plans

Design Vehicle. Turning movements on all local streets and driveways shall, at a minimum, provide similar characteristics as existing movements.

Design Speed. The design speed shall be the existing posted speed limit or greater, except for major alignment transitions, where the design speed may be reduced by ten (10) mph if approved by TxDOT in its sole discretion. In cases where either the current posted speed or the 10 mph reduction in the posted speed allowed for major alignment transitions cannot be achieved, then DB Contractor may lower the design speed for traffic control to the design speed of the proposed facility. Warning signs, as required, shall be placed to inform motorists of the lower speed limits.

Number of Lanes. The minimum number of SH 360 lanes to be maintained during Peak Time shall be the number of lanes currently available on the facility. Lane closures on SH 360 shall be in accordance with Section 18.3.1.2 (Allowable Land and Roadway Closures). Lane closures on other roadways may be considered, within reason, so long as all traffic patterns and accesses are maintained.

Lane Widths. During construction, the minimum lane width for frontage road lanes, and major crossing streets is 11 feet. For minor crossing streets, TxDOT may, in its sole discretion, allow 10 foot lanes in

limited circumstances during construction for short distances after reviewing DB Contractor's traffic control plan.

Shoulders. A minimum 1 foot offset from the edge of travel way to the edge of pavement or traffic barrier is required.

Concrete Traffic Barriers: In low speed areas, where sight distance may be a concern for driveways or roadways, use the Low-Profile type Concrete Traffic Barrier (CTB). CTB shall have drainage slots to reduce risk of water ponding at the vehicle's normal tire paths; however, if CTB is set adjacent to a fill then slots are not required but the gutter flow's ponded width shall not encroach into the vehicle's normal tire paths.

18.3.1.2 Allowable Lane and Roadway Closures

Closures shall only be permitted when DB Contractor can demonstrate that the closure will provide clear benefit to the progress of the Work. Closures must be coordinated with adjacent projects and priority shall be given to the closure submitted first.

18.3.1.2.1 Lane Closures

The safety of workers and the traveling public must be the first consideration when determining the appropriate time to implement a lane closure.

At a minimum, DB Contractor shall inform the PIO by 3:15 p.m. on the previous day of all road closures or major lane closures that will affect mobility so they can inform the public, emergency services, schools, etc. as needed.

Prior to implementing any lane closure, DB Contractor shall input lane closure information into the Highway Conditions and Reporting System (HCRS).

The following TxDOT policy and procedure manuals and references apply for all lane closures:

- Texas Manual of Uniform Traffic Control Devices (TMUTCD)
- TxDOT Traffic Control Plan (TCP) standards
- TxDOT Barricade and Construction (BC) standards
- TxDOT Standard Specifications Item 502 (Barricades Signs and Traffic Handling)

The following lane closure requirements for the SH 360 mainlanes, ramps, frontage roads and cross streets are intended to supplement the above list of manuals and references:

Table 18-1: Lane Closure Requirements

Description of Operations		**Permitted Lane Closures**		
Category of Work	**Roadway Lanes** (one direction)	**Peak Times** Monday-Friday (6:00 am - 9:00 am) (3:30 pm - 7:00 pm) and Major Events and Major Holidays	**Off-Peak Times** Monday-Friday (9:00 am - 3:30pm) (7:00 pm to 10:30 pm) and Saturday	**Lowest Volume Times** Monday-Friday (10:30 p.m. to 6:00 a.m.) and Sunday

Placement of Pavement Markings, Full Depth Roadway Repair, Placement of Bridge Beams, Bridge Demolition or Similar Operations**	3	None	1	2
	2	None	1	1
	1	None	None	None
Adjacent Construction, Lanes for Construction Traffic or Similar Operations	3	None	1	1
	2	None	None	1
	1	None	None	None

**If bridge construction or demolition cannot be performed safely within the requirements in Table 18-1, roads may need to be closed and traffic detoured during the Lowest Volume Times between the hours of 10:30 pm through 6:00 am, Monday to Friday, and Sunday. DB Contractor shall seek TxDOT's approval for such traffic closures a minimum of twenty-one (21) days in advance of a proposed closure

Cross streets may be temporarily closed for 24 hours with approval of TxDOT and the applicable Governmental Entity to allow for the construction of cross structures.

Any complete roadway closure will require a Traffic Control Plan with appropriate detour routing to be submitted to and approved by TxDOT. Any long term closures will require the approval of the District Engineer.

DB Contractor shall seek TxDOT's approval for all required lane closures at least 48 hours in advance for lane closures and fourteen (14) days in advance for complete roadway closures.

If reasonable mobility can be maintained, or exceptional circumstances exist, additional lanes may be closed during Off-Peak Times or Lowest Volume Times with written permission of the TxDOT Project Manager. In such event, with the express written permission of the TxDOT Project Manager, DB Contractor will not be subject to Lane Rental Charges for failure to comply with the Lane Closure requirements. Off-Peak Times may be started earlier or be extended later if reasonable mobility can be maintained.

If at any time delays are in excess of 20 minutes as a result of temporary lane closures during Off-Peak Times and Lowest Volume Times, then modifications to alleviate the congestion shall be taken immediately. Contingency plan of how this will occur should be in place and approved by the TxDOT Project Manager.

Use off duty uniformed police officers as directed by the Engineer.

Inclement weather should be considered when determining closures.

DB Contractor shall maintain continuous construction Work adjacent to closed traffic lanes.

Lane closures must be coordinated with adjacent projects.

DB Contractor shall begin construction Work adjacent to a traffic shift or traffic detour within 3-days of shifting or detouring traffic.

DB Contractor shall reopen closed traffic lanes during planned or actual periods of inactive construction Work greater than or equal to 14 days

18.3.1.3 Driveway Closures

DB Contractor shall maintain a minimum of one driveway per business at all times. For businesses with multiple driveways, when driveway closure is necessary to progress the Work, no driveway may be closed for more than thirty (30) consecutive days or more than forty-five (45) days in a ninety (90) day period.

18.3.1.4 Detour Usage

DB Contractor shall use State routes for detour routes, wherever applicable. If State routes are unavailable, DB Contractor shall use local roadways, provided that DB Contractor has obtained TxDOT approval and the necessary permits from the Governmental Entity having jurisdiction.

DB Contractor shall provide motorists with guidance on the use of alternate routes to divert traffic around the construction, detouring around specific construction sites, and traveling through the construction areas. This shall include the installation and maintenance of temporary regional signs. Motorist guidance to and along detour routes shall be provided, together with regional guidance.

18.3.2 Restricted Hours

a) Holiday Restrictions

DB Contractor shall maintain existing SH 360 facility capacity, from 12:00 p.m. (noon) on the day proceeding, to 10:00 pm on the day after, the major holidays ("Major Holidays") set forth below. No additional lane or ramp closure that restricts or interferes with traffic shall be allowed during Major Holidays. TxDOT has the right to lengthen, shorten, or otherwise modify these restrictions concerning Major Holidays as actual traffic conditions may warrant.

- New Year's Eve and New Year's Day (December 31 through January 1)
- Easter Holiday Weekend (Friday through Sunday)
- Memorial Day Weekend (Friday through Monday)
- Independence Day (July 3 through noon on July 5)
- Labor Day Weekend (Friday through Monday)
- Thanksgiving Holiday (Wednesday through Sunday)
- Christmas Holiday (December 23 through December 26)

b) Event Restrictions

DB Contractor shall maintain existing SH 360 facility capacity for the major regional events set forth below ("Major Events"). No additional lane or ramp closure that restricts or interferes with traffic shall be allowed during Major Events. TxDOT has the right to lengthen, shorten, or otherwise modify these restrictions regarding Major Events as actual traffic conditions may warrant. TxDOT also has the right to modify the list of Major Events as they are added, rescheduled or warranted:

1. Any events held within a ten(10) mile radius of any point along the length of the corridor with an expected attendance greater than 20,000 (restricted from three (3) hours before the start of the event to two (2) hours after the end of the event); and
2. Within one (1) mile radius of major retail traffic generators (i.e. malls) (Thanksgiving Day through January 2).

18.4 Construction Requirements

Construction shall be in accordance with DB Contractor's TMP, the manufacturer's directions or recommendations where applicable, and the applicable provisions of the TMUTCD.

18.4.1 DB Contractor Responsibility

If at any time TxDOT determines DB Contractor's traffic control operations do not meet the intent of the TMP or any specific traffic control plan, DB Contractor shall immediately revise or discontinue such operations to correct the deficient conditions.

DB Contractor shall provide TxDOT the names of the traffic control coordinator and support personnel, and the phone number(s) where they can be reached twenty-four (24) hours per day, seven (7) days per week.

18.4.2 Access

Existing bicycle and pedestrian access and mobility shall be maintained parallel with SH 360 and across all cross streets.

18.4.3 Detours

DB Contractor shall maintain all detours in a safe and traversable condition. A pavement transition, suitable for the posted speed of the section shall be provided at all detour interfaces. DB Contractor shall repair any damage due to detour traffic onto local roads.

18.4.4 Local Approvals

DB Contractor shall communicate any lane closure with the Governmental Entity having jurisdiction within the Project. It shall be the responsibility of DB Contractor to gain approval from the appropriate Governmental Entity for all traffic control measures on each intersecting street.

18.4.5 Changes to Roadway Height and Width Restrictions

Upon placement of the first beam over a roadway, DB Contractor shall notify the TxDOT Project Manager, Area Office, District Bridge Section and the local governing agencies of the actual vertical clearance of newly set beams no later than the following business day.

DB Contractor shall report any changes in the height or width of roadway restrictions during the Work. The reporting shall be made via email to the Texas Department of Motor Vehicles (TxDMV) at mcd_permit-restriction-@txdmv.gov with an email copy to TxDOT Permit Coordinators at FTW_CashPermit@txdot.gov and DAL_CashPermit@txdot.gov and the TxDOT Project Manager using the TxDMV Permit Restriction Application form shown in Attachment 18-1. Increase to the restriction requires a minimum of seven (7) days advance notice while decrease or removal of the restriction must be reported no later than the next business day following the change.

The height and width shall be reported in feet and inches and the distances in miles to the nearest quarter (0.25) mile or from exact intersection to exact intersection.

DB Contractor shall provide advance signing for vertical clearance with clearance height of three (3) inches less than normal clearance along traveled roadway or as dictated by the requirements of the current TxDOT policy.

18.4.6 Pavement Markings

DB Contractor shall be required to remove existing pavement markings that conflict with temporary or permanent pavement markings. These pavement markings shall be removed by any method that does not materially damage the surface or texture of the pavement. Pavement marking removal by over-painting is prohibited.

18.4.7 Reinstatement of Utility Cuts

After installation of drainage structures, storm sewers, or any other public or private Utility by open cut beneath existing pavements carrying traffic during construction, the pavement shall be restored to a structure acceptable to TxDOT or the Governmental Entity having jurisdiction over the affected area and, if applicable, maintained to a riding surface equal to or better than the existing surface.

18.4.8 Hauling Equipment

DB Contractor shall keep traveled surfaces used in its hauling operations clear and free of dirt or other debris that would hinder the safe operation of roadway traffic.

Rubber-tired equipment shall be used for moving dirt or other materials along or across paved surfaces.

Where DB Contractor moves any equipment not licensed for operation on public highways on or across any pavement, DB Contractor shall protect the pavement from all damage caused by such movement. Any damage caused by the operation of DB Contractor shall be repaired at the expense of DB Contractor.

All haul routes utilizing any street of an adjacent Governmental Entity shall be coordinated with the appropriate Governmental Entity.

18.4.9 Final Clean-Up

DB Contractor shall clear and remove from the Site all surplus and discarded materials and debris of every kind and shall leave the entire Project in a smooth and neat condition, after any construction process.

18.4.10 Stockpiles

If TxDOT should elect to exercise the Authority bid option item to provide a sand stockpile, then DB Contractor shall provide one covered stockpile area within the ROW with six 20 feet x 40 feet bins for ice and snow response per Authority standards. Barricades and warning signs are to be placed at stockpiles to adequately warn motorists of a hazard in accordance with TxDOT's Traffic Engineering Standard Sheets and the TMUTCD. No material stockpiles shall be located within the clear zone of any traveled lane, unless positive protection is provided.

19 MAINTENANCE

19.1 General Requirements

DB Contractor shall be responsible for maintenance and repairs to any portion of the Project in a manner that provides a safe and reliable transportation system for improved mobility in accordance with this Section 19.

19.1.1 General Maintenance Obligations

DB Contractor shall take all necessary actions to achieve the following:

a. Maintain the Project and Related Transportation Facilities in a manner appropriate for a facility of the character of the Project;

b. Minimize delay and inconvenience to Users and, to the extent DB Contractor is able to control, users of Related Transportation Facilities;

c. Identify and correct all defects and damage from Incidents;

d. Monitor and observe weather and weather forecasts to proactively deploy resources to minimize delays and safety hazards due to heavy rains, snow, ice, or other severe weather events;

e. Remove debris, including litter, graffiti, animals, and abandoned vehicles or equipment from the Project ROW;

f. Minimize the risk of damage, disturbance, or destruction of third-party property during the performance of maintenance activities;

g. Coordinate with and enable TxDOT and others with statutory duties or functions in relation to the Project or Related Transportation Facilities to perform such duties and functions;

h. Perform systematic Project inspections, periodic maintenance, and routine maintenance in accordance with the provisions of DB Contractor's Maintenance Management Plan and DB Contractor's Safety Plan;

i. Maintain and otherwise be responsible for the operational and maintenance requirements for the Project frontage roads and cross streets, including the repair, maintenance and operation of the traffic signal systems and safety lighting;

j. Drive the construction site at the beginning of the work day and again at the end of the work day to identify any potential hazard defects; and

k. DB Contractor shall assume and execute TxDOT's responsibilities and duties for the maintenance of frontage road signals and lighting, including installation, repair, replacement and coordination with applicable Governmental Entities.

19.1.2 Maintenance Management Plan (MMP)

DB Contractor shall prepare a Maintenance Management Plan (MMP) that is consistent with the general maintenance obligations described in Section 19.1, and defines the process and procedures for the maintenance of the Project for the Term of the DBA. The MMP shall include performance requirements, measurement procedures, threshold values at which maintenance is required, inspection procedures and frequencies, and subsequent maintenance to address noted deficiencies, for each physical Element of the Project in accordance with Tables 19-1 and 19-2, including impacts to Related Transportation Facilities. The MMP shall identify response times to mitigate hazards, permanently repair Defects as well as tracking all Hazard Mitigation Classification and Construction Violation Classifications with the

associated timeframes for response and repair. DB Contractor shall update this plan as required, or at least annually.

The MMP shall include procedures for managing records of inspection and maintenance activities, including appropriate measures for providing protected duplication of the records. Inspection and maintenance records shall be kept for the Term of the DBA and shall be provided to TxDOT at the time the Project is delivered to TxDOT, at either the expiration of the Term or earlier termination of the DBA.

The documents listed below are documents TxDOT currently uses and are strictly for "information purposes only" in the development of the MMP. TxDOT does not warrant or guarantee, in any way, the outcomes achieved by DB Contractor in using any of these documents.

1. Maintenance Operations Manual
2. Maintenance Management Manual
3. Roadside Vegetation Management Manual
4. Herbicide Operations Manual
5. Herbicide Recordkeeping Book
6. Traffic Operations Manual
7. Sign Crew Field Book
8. Highway Condition Report (HCR) Manual
9. Use of Right-of-Way by Others Manual
10. Material Producer List
11. Department's Function Code Chart 12

DB Contractor shall submit the MMP to TxDOT for review and approval at least sixty (60) Days prior to the issuance of NTP2. Approval by TxDOT of the MMP shall be a condition of NTP2.

19.1.3 Maintenance During Work

DB Contractor shall be responsible for maintenance and repairs to any portion of the Work until Final Acceptance is issued in accordance with the DBA Documents. The Work shall include maintenance (such as litter pickup, mowing, and repair of third-party-damaged traffic control and safety devices), responding to emergencies and operational problems, and inspections and repairs required on an as-needed basis, or as directed by TxDOT until issuance of Final Acceptance, unless TxDOT issues Maintenance NTP1 under the Comprehensive Maintenance Agreement. If DB Contractor fails to perform such maintenance within ten (10) Business Days of discovery of the need for the work, TxDOT reserves the right to perform such work as it deems necessary with its own forces, and/or to enter into special contracts for the maintenance of specific items.

For purposes of this Section 19, each cure period shall be deemed to start, for purposes of assessing Performance Assessment Charges, in the manner set forth in Section 1 of Exhibit 21 to the DBA (Performance Assessment Charges for Defect Hazard Mitigation Classifications and Construction Violation Classifications)

19.1.4 Defect Hazard Mitigation Classifications

Defect Hazard Mitigation Classifications result from the failure to respond to an Element Category as detailed in Table 19-1 with the necessary resources and equipment to provide a temporary mitigation to the Defect. Defect Hazard Mitigation Classifications shall be subject to Performance Assessment Charges during the Work.

19.1.5 Construction Violation Classifications

Construction Violation Classifications result from the failure to meet the minimum requirements set forth in Table 19-2 within the applicable cure period (if any) for the maintenance limits during the Term. Construction violations detailed in Table 19-2 are the minimum requirements DB Contractor shall meet during the Term. Construction Violation Classifications shall be subject to Performance Assessment Charges during the Work.

19.1.6 Performance Requirements during Construction

DB Contractor is responsible for operations and maintenance of all Element categories as described in Tables 19-1 and 19-2 within the maintenance limits, including the existing Elements. The term "existing" means Element categories in place and operating prior to commencement of construction of the Work.

DB Contractor shall perform an inspection and evaluation of all the assets detailed in Table 19-2 and evaluate the asset's conditions to determine if the asset meets the minimum performance requirements.

DB Contractor shall prepare and submit to TxDOT for review, concurrently with the submission of the MMP, a Work plan that demonstrates how the Performance Requirements for each Element having an asset condition not meeting the Performance Requirements specified in Table 19-2 will be fully met and maintained by the Substantial Completion date.

Additionally, DB Contractor is responsible to respond to any event detailed in Table 19-1 with the necessary resources and personnel to provide a temporary mitigation to a Defect Hazard Category Event within the period outlined in Table 19-1.

19.1.7 Performance Requirements for Existing Pavement at Substantial Completion

Existing mainlane, ramp, frontage road and cross street pavement that does not meet the performance standards set forth below shall be repaired and resurfaced in accordance with Section 8.2.3 of these Technical Provisions:

- Existing mainlane road pavement to remain shall have a pavement ride quality of 95 inches per mile;
- Existing frontage road pavement to remain shall have a pavement ride quality of 110 inches per mile;
- Existing ramps and cross street pavement to remain shall have a ride quality of 1/8" in. variance between any two contacts on a 10-ft straightedge; and
- All existing pavement shall have a skid number in excess of 30, shall be free of Defects, have a minimum Pavement Condition Score of 80, and have no standing water that remains on the pavement eight hours after a rain event at Substantial Completion.

Table 19-1: Defect Hazard Category

Event No.	Event	Minimum Performance Requirements	Defect Hazard Mitigation Classification[1]		Cure Period	Interval of Recurrence
			Mainlanes	All Other Lanes		
19-1.1	Incident response	Respond to and initiate traffic control to secure sites of Incidents, Emergencies, accidents, and other Events that result in a condition that is unsafe and/or may present a life threatening condition, such as, at a minimum, fuel spills, debris, pavement failure (e.g. pot holes, etc.), flooding, guardrail failures, attenuator faults, and other events.	1D	1C	30 Min	30 Min
		Provide all necessary equipment, staff and resources to clean up and open the travel lanes at the sites of Incidents, Emergencies, accidents and other Events such as, at a minimum, fuel spills, debris, pavement failure (e.g. pot holes, etc.), flooding, guardrail failures, attenuator faults, and other Events after release by the Emergency Services in order to correct the Event and provide a safe passage for the traveling public.	1D	1C	2 Hours	Hourly
19-1.2	Roadway operations (broken down or stranded vehicles)	Notify law enforcement of broken down or stranded vehicles in travel lanes and initiate traffic control to secure the site until travel lanes are cleared. Assist in the removal of vehicles from the travel lanes.	1C	1B	30 Min	Hourly
19-1.3	Roadway surface debris - normal	Remove and dispose of debris from travel lanes that would potentially cause a safety hazard to the traveling public, including at a minimum, objects, dead animals and tires.	1D	1C	30 Min	30 Min
19-1.4	Roadway surface debris - large	Debris too large to be removed within the above timeframe will require that the roadway be closed and then such debris shall be removed from the travel lanes. This closure shall comply with TxDOT standards.	1D	1C	2 Hours	Hourly
19-1.5	Flexible pavement pot holes or rigid pavement spalls	Manage the Project's pavement and respond with the necessary equipment and personnel to provide a temporary mitigation to any potholes or spalls that would potentially cause a safety hazard to the traveling public.	1D	1C	60 Min	Hourly

Table 19-1: Defect Hazard Category						
Event No.	**Event**	**Minimum Performance Requirements**	**Defect Hazard Mitigation Classification[1]**		**Cure Period**	**Interval of Recurrence**
			Mainlanes	**All Other Lanes**		
19-1.6	**Flooding of travel lane**	The travel lane is free from water to the extent that such water would represent a hazard by virtue of its position and depth. No portion of a lane can have standing water that exceeds the criteria listed in Section 12 of the Technical Provisions that would potentially cause a safety hazard to the traveling public.	1D	1C	30 Min	Hourly
19-1.7	**Guardrail**	Maintain the Project's guardrail sections and respond with the necessary equipment and personnel to provide a temporary mitigation to any damaged guardrail that would potentially cause a safety hazard to the traveling public.	1C	1B	2 Hours	Hourly
19-1.8	**Attenuators**	Maintain the Project's attenuator systems and respond with the necessary equipment and personnel to provide a temporary mitigation to any damaged attenuator that would potentially cause a safety hazard to the traveling public.	1C	1B	2 Hours	Hourly
19-1.9	**Signs (single or multi-post)**	Maintain the Project's single and multi-post signs systems and respond with the necessary equipment and personnel to provide a temporary mitigation to any damaged or down signs that would potentially cause a safety hazard to the traveling public.	1C	1B	2 Hours	Hourly
19-1.10	**Traffic signals**	Maintain the Project's traffic signal system and respond with the necessary equipment and personnel to provide a temporary mitigation to any damaged or down traffic signal that would potentially cause a safety hazard to the traveling public.	1C	1B	30 Min	Hourly
19-1.10	**Highway light poles**	Maintain the Project's highway lighting system and respond with the necessary equipment and personnel to provide a temporary mitigation to any damaged or down light poles that would potentially cause a safety hazard to the traveling public.	1C	1B	60 Min	Hourly
19-1.11	**Barrier wall**	Maintain the Project's barrier wall sections and respond with the necessary equipment and personnel to provide a temporary mitigation to any damaged barrier wall section that would potentially cause a safety hazard to the traveling public.	1C	1B	60 Min	Hourly
19-1.12	**Bridge/ structure impact**	Maintain the Project's bridges/structures and respond with the necessary equipment and personnel to provide a temporary mitigation to any damaged bridge/structure that would potentially cause a safety hazard to the traveling public.	1E	1D	60 Min	Hourly

Table 19-1: Defect Hazard Category						
Event No.	**Event**	**Minimum Performance Requirements**	**Defect Hazard Mitigation Classification[1]**		**Cure Period**	**Interval of Recurrence**
			Mainlanes	**All Other Lanes**		
19-1.13	**Pavement failures**	Instances of failures do not exceed the failure criteria set forth in the Authority's Pavement Management Rating System, including base failures, punch-outs and jointed concrete pavement failures.	1E	1D	24 Hours	24 Hours

[1] See Exhibit 21(Performance Assessment Charges For Defect Hazard Mitigation Classifications And Construction Violation Classifications) of the Design-Build Agreement for classifications.

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
ELEMENT CATEGORY – ROADWAY						
19-2.1	**Pavement (all)**	Inspection of the pavement after major damage such as fire, fuel spill or other incident/Event.	Conduct a visual inspection of the affected area.	2A	24 Hours	24 Hours
			Provide written recommendation for remedial work to the TxDOT after the inspection of the affected area.	2A	10 Days	24 Hours
			Complete repairs set forth in the written recommendation for the remedial work.	2C	30 Days	7 Days
		Maintain all pavement sections within the Project.	Maintain all roadway surfaces, including those in construction areas, including detours and temporary facilities, free of dust, pot holes, and rutting. Manholes/crosswalks/joint cannot exceed one (1) inch above the riding surface in accordance with TxDOT design standards.	2C	2 Days	24 Hours
			Pavement shall be maintained to ensure it is functioning as intended and in the case of a pavement failure, perform repairs/mitigation which exceeds the failure criteria set forth in the Authority's Pavement Management Rating System, including potholes, base failures, punchouts and jointed concrete pavement failures.	2C	28 Days	10 Days
ELEMENT CATEGORY – MAINTENANCE OF TRAFFIC						
19-2.2	**Maintenance of traffic**	Install and maintain traffic control and safety devices.	Maintain the Project free of conflicting pavement markings and ensure all work zone pavement markings, including, at minimum, centerlines, raised pavement markers, lane lines, edge lines, stop bars and turn arrows are installed in accordance with TMUTCD, TCP standards, and Barricade & Construction (BC) standards.	2B	24 Hours	24 Hours
			Provide and maintain continuous access for residents and business along frontage roads and within intersections, including driveway maintenance, as necessary for a safe, stable and reasonable access.	2B	4 Hours	4 Hours

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
			Maintain all detours in accordance with DB Contractor's Design Documents, including all signs, arrow boards, variable message signs for the safe passage of traffic and pedestrian movements.	2C	2 Hours	6 Hours
			Timely removal or covering of temporary detours signs and devices that are no longer needed.	2A	24 Hours	24 Hours
			Provide Traffic Control Officers in accordance with DB Contractor's Design Documents and in accordance with TMUTCD, TCP standards, and BC standards.	2A	2 Hours	2 Hours
			Maintain temporary traffic control devices including signs, barricades, lights and cones as detailed in DB Contractor's Design Documents and in accordance with TMUTCD, TCP standards, and BC standards and keep these devices in the correct position, properly directed, clearly visible, upright and clean.	2B	2 Hours	2 Hours
			Provide and maintain work zone signs in accordance with DB Contractor's Design Documents and in accordance with TMUTCD, TCP standards, and BC standards with appropriate hardware, supports and are installed in accordance with TxDOT design standards.	2B	24 Hours	24 Hours
			Provide and properly maintain drop off conditions in work zones in accordance with TMUTCD, TCP standards, and BC standards.	2C	6 Hours	6 Hours
			Maintain high intensity flashing lights, warning/channelizing devices including cones, temporary barrier wall, arrow boards, Portable Changeable Message Signs (PCMS), Portable Regulatory Signs in accordance with DB Contractor's Design Documents and in accordance with TMUTCD, TCP standards, and BC standards operational and functional at all times.	2B	12 Hours	6 Hours

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
			Within an active lane closure, maintain warning/channelizing devices including cones, arrow boards, Portable Changeable Message Signs (PCMS), Portable Regulatory Signs in accordance with TMUTCD, TCP standards, and BC standards and in accordance with TxDOT design standards operational and functional at all times.	2B	2 Hours	2 Hours
ELEMENT CATEGORY – DRAINAGE						
19-2.3	**Pipes and channels**	Maintain each Element of the drainage system.	Each Element of the drainage system is maintained in its proper function by cleaning, clearing and/or emptying as appropriate from the point at which water drains from the travel way to the outfall or drainage way. Pipes and channels shall not have more than 10% of cross section area obstructed.	2B	30 Days	7 Days
19-2.4	**Drainage treatment devices**	Maintain all drainage treatment and balancing systems, flow and spillage control devices.	Drainage treatment and balancing systems, flow and spillage control devices function correctly and their location and means of operation are recorded adequately to permit their correct operation in Emergency. Ensure they are functioning correctly with means of operation displayed.	2B	10 Days	5 Days
19-2.5	**Discharge systems**	Maintain surface water discharge systems.	Surface water discharge systems perform their proper function and discharge to groundwater and waterways complies with the relevant Laws and Governmental Approvals.	2B	30 Days	7 Days
ELEMENT CATEGORY – PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS						
19-2.6	**Delineators and markers**	Maintain object markers, mail box markers and delineators.	95% of the delineators and markers are free from Defects, are clean and visible, are of the correct color and type, and are legible, reflective, straight and vertical.	2A	30 days	15 Days
ELEMENT CATEGORY – GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS						

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
19-2.7	**Guardrail/safety barriers, concrete barriers (temporary or permanent)**	Maintain the Project's guardrail, safety barriers, and concrete barriers sections and repair any damaged guardrail safety barriers, and concrete barriers.	All guardrails, safety barriers, concrete barriers (temporary or permanent) are free of Defects that would potentially cause a safety hazard to the traveling public. They are appropriately placed and correctly installed at the correct height and distance from roadway or obstacles. Installation and repairs shall be carried out in accordance with the requirements of NCHRP 350 standards.	2B	7 Days	24 Hours
19-2.8	**Attenuators**	Maintain the Project's attenuators.	All impact attenuators are appropriately placed, correctly installed, and free of damage.	2B	7 Days	24 Hours
ELEMENT CATEGORY – TRAFFIC SIGNS						

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
19-2.9	**Traffic signs**	Maintain signs at acceptable level of safety for the traveling public.	a) Retroreflectivity coefficient is not below the requirements of TxDOT's TMUTCD. b) Face damage does not exceed 5% of surface area. c) Placement of signs is in accordance with TxDOT's Sign Crew Field Book and shall not be twisted or leaning. d) Sign Information is of the correct size, location, type and wording to meet its intended purpose and any statutory requirements. e) "Stop," "Yield," "Do Not Enter," "One Way" and "Wrong Way" signs are undamaged. f) Signs are clean, correctly located, clearly visible, legible, reflective, at the correct height and free from structural and electrical Defects. g) Identification markers are provided, correctly located, visible, clean and legible. h) Sign mounting posts are vertical, structurally sound and rust free. i) All break-away sign mounts are clear of silt or other debris that could impede break-away features and shall have correct stub heights. j) Obsolete and redundant signs, per TMUTCD implementation requirements, are removed or replaced as appropriate. k) Visibility distances meet the stated requirements. l) All structures and Elements of the signing system are kept clean and free from debris and have clear access provided. m) All replacement and repair materials and equipment are in accordance with the requirements of the TMUTCD.	2B	30 Days	5 Days

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
		Perform a bi-annual inspection of all signs on the Project and submit inspection reports to TxDOT.	Complete an inspection of all the signs on the Project on a bi-annual basis.	2A	0	24 Hours
			Complete repairs identified in the inspection report.	2B	60 Days	5 Days
ELEMENT CATEGORY – HIGHWAY LIGHTING (TEMPORARY OR PERMANENT)						
19-2.10	**Highway lighting**	Maintain the highway lighting system.	Replace any light poles damaged or knocked down by traffic accidents or Incidents.	2A	14 Days	24 Hours
		Perform a monthly inspection in order to monitor and maintain highway lighting.	a) Roadway lights - A minimum of ninety percent (90%) of the lights in the highway lighting system are operational and no more than two consecutive lights are out. b) Sign lighting – no sign has more than one bulb not working. c) Complete repairs identified in the monthly inspection d) All lighting is free from Defects and provides uniform lighting quality. e) Lanterns are clean and correctly positioned. f) Lighting units are free from accidental damage or vandalism. g) Columns are upright, correctly founded, and structurally sound.	2A	10 Days	24 Hours
		Maintain the electricity supply, feeder pillars, cabinets, switches and fittings.	Electricity supply, feeder pillars, cabinets, switches and fittings are electrically, mechanically and structurally sound and functioning	2A	14 Days	24 Hours
ELEMENT CATEGORY – FENCE, WALLS, AND SOUND ABATEMENT						

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
19-2.11	**Fence, walls and sound abatement**	Maintain fence, walls and sound abatement at an acceptable level of safety for the traveling public.	All fence, walls and sound abatement act as designed and serve the purpose for which they were intended.	2C	30 Days	7 Days
19-2.12	**Access gates**	Maintain all access gates locked during periods of no work activity.	All construction access gates shall be locked at the end of each construction work day. No gates shall remain open or unlocked.	2B	2 Hours	1 Hour
ELEMENT CATEGORY – ROADSIDE MAINTENANCE						
19-2.13	**Mowing**	Maintain roadside mowing at an acceptable level of maintenance.	Mowing shall be maintained such that: a) All grassing in the urban areas require that 95% of height of grass and weeds between 5 in. and 18 in. Mowing begins before vegetation reaches the maximum height. b) Spot mowing at intersections, ramps or other areas maintains visibility of appurtenances and sight distance. c) Grass or vegetation does not encroach into or on paved shoulders, travel lanes, sidewalks, islands, riprap, traffic barrier or curbs. d) A full width mowing cycle is completed after the first frost. e) Wildflowers are preserved utilizing the guidelines in the mowing specifications and TxDOT Roadside Vegetation Manual.	2A	24 Hours	7 Days
19-2.14	**Herbicide program**	Maintain the Project at an acceptable level of service	A herbicide program is undertaken in accordance with the TxDOT Herbicide Manual to control noxious weeds and to eliminate grass in pavement or concrete.	2A	14 Days	7 Days
19-2.15	**Environmental Compliance**	Monitor wetland and other Environmental Approvals obtained during construction.	Comply with all requirements of Environmental Approvals, including monitoring and reporting requirements.	2B	24 Hours	24 Hours

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
		Manage the Erosion Control and Storm Water Pollution Prevention Plan	Provide and maintain all erosion control features in accordance with DB Contractor's Design Documents and TxDOT design standards.	2B	24 Hours	24 Hours
19-2.16	**Protected species**	Manage the Project to ensure that Named species and habitats are protected.	Compliance with the Required Task	2B	30 Days	30 Days
ELEMENT CATEGORY – SWEEPING AND CLEANING						
19-2.17	**Litter removal**	Keep the ROW in a neat condition, remove litter regularly. Pick up large litter items before mowing operations. Dispose of all litter and debris collected at an approved solid waste site.	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed	2A	5 Days	3 Days
19-2.18	**Road & bridge sweeping**	Maintain the roadway and shoulders in order to prevent the buildup of dirt, ice rock, debris, etc. on roadways and bridges.	a) Prevent dirt, ice, rock, debris, etc. on roadways and bridges from accumulating greater than 24" wide or 1/2" deep. b) Keep all channels, hard shoulders, gore areas, ramps, intersections, islands and frontage roads swept clean. c) Clear and remove debris from traffic lanes, hard shoulders, verges and central reservations, footways and cycle ways. d) Remove all sweepings without stockpiling in the ROW and dispose of at approved tip.	2B	5 Days	3 Days
ELEMENT CATEGORY – PEDESTRIAN FEATURES						

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
19-2.19	**Concrete sidewalk and pedestrian curb ramps**	Maintain sidewalk, pedestrian curb ramps at an acceptable level of safety for the traveling public.	All pedestrian Elements act as designed, serve the purpose for which they were intended, and shall meet the performance requirements set forth in the TxDOT design standards and Americans with Disabilities Act (ADA) requirements.	2A	30 Days	24 Hours
ELEMENT CATEGORY – TRAFFIC SIGNAL						
19-2.20	**Traffic signal**	Maintain all traffic signals at acceptable level of safety for the traveling public.	Traffic signals and their associated equipment are clean and visible, correctly aligned and operational, free from damage, correctly aligned and operational and Signal timing and operation is correct.	2B	5 Days	24 Hours
			Contingency plans are in place to rectify Hazard Defects not immediately repairable to assure alternative traffic control is provided during a period of failure.	2C	2 Days	24 Hours
			Traffic signals are structurally and electrically sound.	2A	30 Days	10 Days
19-2.21	**Identification marking**	Maintain identification markings.	Signals have identification markers and the telephone number for reporting faults are correctly located, clearly visible, clean and legible.	2A	30 Days	5 Days
19-2.22	**Pedestrian Elements and vehicle detectors**	Maintain all pedestrian and vehicle detectors.	All pedestrian Elements and vehicle detectors are correctly positioned and fully functional at all times.	2A	5 Days	24 Hours
ELEMENT CATEGORY – ITS and ETCS EQUIPMENT (Not used)						
ELEMENT CATEGORY – AMENITY						
19-2.23	**Graffiti**	Maintain assets free of graffiti.	Graffiti is removed in a manner and using materials that restore the surface to a like appearance similar to adjoining surfaces.	2A	24 Hours	24 Hours
19-2.24	**Animals**	Remove animals.	All dead or injured animals are removed from the pavement.	2C	2 Hours	1 Hour
			All dead or injured animals are removed from the ROW	2C	24 Hours	24 Hours
19-2.25	**Abandoned vehicles and/or equipment**	Notify Law Enforcement for the removal of vehicles and/or equipment from within the Project Limits	Notify law enforcement of any abandoned vehicles and/or equipment for the removal from the Project ROW.	2C	24 Hours	24 Hours
ELEMENT CATEGORY – SNOW AND ICE						

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
19-2.26	**Snow and ice**	Use reasonable efforts to maintain travel way free from snow and ice.	Response time to complete manning and loading of spreading vehicles. a) For forecasted snow and ice events, spreading vehicles are manned and loaded prior to a designated activation time. For unexpected snow and ice events, spreading vehicles are manned and loaded within 1 Hour	2C	1 Hour	30 Min
			Response time for snow and ice clearance vehicles to depart from base. a) For forecasted snow and ice events, manned and loaded vehicles are dispatched on or before occurrence of the event. For unexpected snow and ice events, manned and loaded vehicles are dispatched within 1 Hour after inception of the event.	2C	1 Hour	30 Min
19-2.27	**Weather forecasting**	Weather forecast information is obtained and assessed and appropriate precautionary treatment is carried out to minimize ice forming on the travel way.	Comply with Maintenance Management Plan (MMP) to prevent ice forming on the travel way.	2C	1 Hour	30 Min
19-2.28	**Operational plans**	Implement snow and ice clearance operating to maintain traffic flows during and after snowfall and restore the travel way to a clear condition as soon as possible.	Comply with Maintenance Management Plan (MMP) for snow and ice clearance plans to maintain traffic flows during and after snowfall and restore the travel way to a clear condition as soon as possible.	2A	1 Hour	1 Hour
ELEMENT CATEGORY – INCIDENT RESPONSE						

Table 19-2: Construction Violation Events						
Element No.	**Element**	**Required Task**	**Minimum Performance Requirements**	**Construction Violation Classification[1]**	**Cure Period**	**Interval of Recurrence**
19-2.29	**Incident response**	Monitor the Project and respond to Incidents in accordance with the Maintenance Management Plan (MMP).	Comply with the Maintenance Management Plan (MMP) for the following: a) Response times met for 98% of Incidents measured on a 1 year rolling basis. b) Complaints from Emergency Services promptly resolved to TxDOT's satisfaction.	2E	0	0
19-2.30	**Incidents involving Hazardous Materials.**	Monitor the Project and respond to Incidents involving Hazardous Materials.	Comply with the Maintenance Management Plan (MMP) and comply with the requirements of the HMMP.	2D	1 Hour	1 Hour

Notes:

1. See Exhibit 21 (Performance Assessment Charges For Defect Hazard Mitigation Classifications And Construction Violation Classifications) of the Design Build Agreement for classifications.

20 BICYCLE AND PEDESTRIAN FACILITIES

20.1 General Requirements

This Section 20 (General Requirements) includes requirements pursuant to which DB Contractor shall design and construct bicycle and pedestrian facilities for the Project. DB Contractor shall ensure the bicycle and pedestrian facilities of this Project support TxDOT's commitment to integrate bicycle and pedestrian travel into Project development. DB Contractor shall coordinate the Elements of this Project with the existing and planned on and off-road bicycle and pedestrian facilities of Governmental Entities for pedestrians and cyclists including, but not limited to, the NCTCOG Regional Veloweb of Bicycle and Pedestrian Off-Street Facilities.

20.2 Administrative Requirements

DB Contractor shall maintain and keep operational all bicycle and pedestrian facilities during construction and throughout the Term of the DBA Documents. DB Contractor shall consider and address pedestrian and cyclist safety throughout the construction phase.

20.3 Design Requirements

20.3.1 Bicycle Facilities

DB Contractor shall be consistent with the local bicycle and pedestrian plan. DB Contractor shall coordinate with state and local Governmental Entities to ensure consistency with regional multi-modal facilities.

DB Contractor's facilities shall meet the requirements of the AASHTO *Guide for the Development of Bicycle Facilities* and shall incorporate the following Elements relating to bicycle facilities into the design:

a. Alignment, profile, cross-section and materials;
b. Points of connection to existing and proposed bicycle facilities;
c. Signing, signalization, and pavement markings;
d. Separation between bicycle facilities and the nearest vehicular travel lane, except where the outside lane accommodate bicycles;
e. Methods of illumination, where applicable; and
f. Requirements submitted in the Aesthetics Plan.

In areas where new frontage roads are constructed as a part of the Work, the outside lane shall be 14 feet of usable width plus a 2 foot offset to face of curb at the UPRR bridge only to accommodate bicycles and vehicles. Usable width is measured from center of the traffic lane line to center of the edge line or the longitudinal joint of the gutter pan; gutter pan is not included in useable width.

20.3.2 Pedestrian Facilities

DB Contractor shall design, construct, and maintain sidewalks along the frontage roads and cross streets where sidewalks currently exist and where shown on the Base Scope Schematic. Sidewalks and pedestrian facilities shall comply with the *Texas Accessibility Standards*. DB Contractor shall install pedestrian signals, crosswalks, and curb ramps at all signalized intersections. All pedestrian facilities shall be designed to incorporate ambulatory, visibility, and auditory needs of all users and shall include the following Elements related to pedestrian facilities:

a. Alignment, profile, cross-section and materials;

b. Points of connection to pedestrian facilities;
c. Signing, signalization, and pavement markings;
d. Separation between sidewalks facilities and nearest travel lane;
e. Methods of illumination, where applicable; and
f. Requirements submitted in the Aesthetics Plan.

The use of raised concrete islands may be considered for providing refuge for crossing pedestrians.

All pedestrian/bicycle facilities must be designed in accordance with the latest *Americans with Disabilities Act Accessibility Guidelines* (ADAAG).

DB Contractor is responsible for obtaining TDLR reviews and approvals of pedestrian facility design and construction.

21 TOLLING

21.1 Contractor's Responsibilities

DB Contractor shall design and construct structures and infrastructure to support the toll system, including but not limited to pavements, ETCS signing, equipment enclosures and buildings, foundations, column gantries, and communication and electrical services, conduits and conductors. The toll system is to be designed to support all electronic toll collection. Structures are required to support electronic tolling. DB Contractor's responsibilities, relating to the toll systems, fall into four (4) general areas: site, subgrade, at grade, and above grade. All construction materials shall be in accordance with these Technical Provisions. DB Contractor shall not use any experimental or previously unapproved materials for incorporation into the Project. DB Contractor shall design and construct tolling infrastructure to support the installation of the toll collection system components by others, hereafter referred to as the Systems Integrator (SI). A complete listing of DB Contractor/TxDOT/Integrator construction responsibilities is provided in Attachment 21-1, Toll Facility Responsibilities Matrix.

Site: DB Contractor must design, procure, and/or construct various site infrastructure Elements, including Toll Zone foundations and above ground equipment slabs to support the SI's installation of the toll collection system. DB Contractor shall be responsible for bringing the power source to the Project at the ROW line for supporting all tolling and network equipment. DB Contractor shall provide power for various non-tolling components as well. DB Contractor shall be responsible for the design of the communication infrastructure backbone and laterals required along the corridor and at the tolling points.

Subgrade: DB Contractor shall design and construct conduits and duct banks systems for communication and power distribution systems. DB Contractor is responsible for all underground conduits from the power source to the gantries, including junction boxes and all communication fiber. Subgrade items including, but not limited to, utilities, gantry foundations, and drainage systems shall be coordinated with and accommodate the Authority's toll collection system. Unless otherwise specified herein, the Work shall be governed by the Authority standards and specifications. DB Contractor shall design and construct all conduit and duct bank systems as per NESC, NEC (NFPA 70), the Authority and TxDOT electrical design standards and details, and the SI requirements. DB Contractor is responsible for incorporating the toll collection systems subgrade requirements into the Project Design.

At Grade: DB Contractor shall design and construct various at grade Elements including, but not limited to, pavement sections, site work, power source to support the installation of the toll collection system, and all junction boxes, conduit, and duct banks. DB Contractor shall construct, as part of the Work, all paving and roadway work, and special pavement sections inclusive of in pavement vehicle detection and classification system infrastructure (inductive loops provided and installed by SI) at the Toll Zone areas in accordance with Authority's tolling standards and specifications. DB Contractor shall design and construct primary power service and the facilities required to support the emergency natural gas generator backup electrical service systems, if natural gas is available. The Authority standard requires an emergency generator and natural gas supply at mainlane gantry locations only. DB Contractor shall provide and install the emergency backup generator system and provide fuel to the mainlane emergency generator. However, if tie-ins to existing natural gas supply lines can be proven to be exceedingly costly, a generator fueled by propane may be proposed. The proposed propane fueled generator must include all hardware, fuel storage tank(s), supply lines, maintenance access, security infrastructure, fencing, equipment pad(s), bollards, and refueling truck parking area to provide a complete functioning emergency back up system. If proposed, the propane fueled system must be approved by TxDOT and the Authority prior to finalizing design. DB Contractor is responsible for lightning protection, and electrical grounding systems. DB Contractor shall design and construct the concrete slabs to support the environmentally controlled roadside cabinets that house and support the physical components of the toll collection system.

Above Grade: DB Contractor shall design and construct various above grade Elements, including but not limited to, gantry columns, gantry truss to support the installation of the toll collection system, equipment support framing on gantry truss, construction of the roadway, environmentally controlled buildings and enclosures, and other miscellaneous civil works. The gantries shall include lightning protection and supporting frame to hold toll collection equipment. DB Contractor shall design and install all signage related to each tolling location. DB Contractor shall design and construct gantries and toll equipment supports. All guide, warning, regulatory, and special toll signs pertaining to the Work shall be in accordance with TxDOT and Authority standards and the TMUTCD.

Special Considerations: DB Contractor shall design and construct facilities that will accommodate the installation and operation of the ETCS. It is the responsibility of DB Contractor to provide qualified and experienced designers and be aware of various constraints and considerations within the toll collection system. Small, environmentally controlled buildings and enclosures are required to house certain toll system components. Working with the SI, the DB Contractor will establish the precise locations for building and/or enclosure and incorporate them into the design and construct as necessary. All buildings shall comply with the Authority standards.

DB Contractor shall complete Toll Zone Work items prior to TxDOT coordinating the installation, integration, testing and commissioning of the tolling system. Toll Zone Work items include:

a. Final pavement through the Toll Zone (100 feet on each side of the centerline of the toll gantry with unobstructed access);
b. Complete Toll Zone inclusive of gantries and buildings;
c. Complete duct banks and conduits in vicinity of Toll Zone location;
d. Installation of permanent power;
e. Support foundations required for equipment installations;
f. Roadside cabinet slabs;
g. Lightning protections and grounding systems;
h. Complete paving for the Project;
i. Complete duct banks for the Project;
j. Complete lighting for the Project;
k. Communications network equipment provided by the SI and associated connections; and
l. Generator, load bank and associated infrastructure including fuel tank and fuel.

21.2 Design and Construction Requirements

DB Contractor shall design and construct the required structures to support the installation and operation of the toll system. DB Contractor's toll system structures shall be in accordance with the Authority's Standards including the following:

a. Main Lane Gantry (MLG-001-2009, MLG-002-2008, MLG-003-2009, MLG-004-2009)
b. Ramp Gantry (RG-001-2009,RG-002-2008, RG-003-2009, RG-004-2009)
c. Main Lane Gantry Precast (MGP-002-2009)
d. Ramp Gantry Precast (RGP-002-2009)

Equipment Enclosures. DB Contractor shall provide and install all necessary equipment enclosures to support tolling. DB Contractor shall use equipment enclosures to house the toll collection equipment and ITS components. DB Contractor shall establish the precise location of the equipment enclosures in accordance with Authority ramp and mainlane gantry standards. The equipment enclosures shall meet the Authority's mechanical, electrical, environmental, and security requirements.

The network cabinet and tolling equipment cabinet will be supplied and installed by the SI.

Gantries. DB Contractor shall design and construct all necessary gantries to facilitate roadside toll collection system operations. Both the toll lanes and ramp locations require gantries to mount antennas, cameras, vehicle separation equipment, and other toll system components. Working with the SI, DB Contractor shall establish the precise locations for each of the gantry structures. Foundation, Tower and Truss design shall be in accordance with Authority requirements. Ramp gantries shall be located to accommodate the ultimate ramp alignment.

Signage. DB Contractor shall be responsible for the design and construction of the toll facility signage.

Horizontal Alignment. The toll approach and departure areas shall be located in a tangent segment of roadway enabling adequate sight distance for identification on approach. However, the current location of the mainlane toll gantry at approximately mainlane sta 1113+00 is an acceptable location.

Longitudinal Slope. Gantries shall be located within a horizontal tangent section of the road with vertical grade between 0.3% minimum to 5.0% maximum with 1% desirable grade. Gantries located within vertical curves are not allowed.

Cross Slope. Through the toll collection area, cross slopes shall range from 0.5% minimum to 4% maximum with 2% desirable. Adequate care should be taken to ensure the roadway drains properly with no ponding or sheet flow. No curb or slotted drain inlets are allowed within the Toll Zone.

Pavement. Pavement shall be in accordance with Authority's tolling standards and specifications. Concrete pavement requires continuous reinforcement within the Toll Zone. Pavement design shall be coordinated with TxDOT, the Authority, and the SI prior to design and pavement joints shall not be located within the tolling loop detection locations.

Parking Lot and Driveway. DB Contractor shall be responsible for design and construction of various parking lot and driveway components to support the installation and maintenance of the toll collection system. The ramp gantry parking lot/maintenance access area shall be 40' long and a minimum of 10' wide exclusive of the shoulder width. Parking lots and driveways shall be included to support the installation and maintenance access of the toll collection system. Parking and driveways shall be designed to comply with the TxDOT Roadway Design Manual and the Authority gantry standards.

Bonding and Grounding. DB Contractor is responsible for all electrical facility grounding circuits and lightning protection systems and conductors. All conductors entering the toll facility shall be protected, bonded, and grounded to route lighting strike currents away from all electrical and electronic systems. DB Contractor shall design and construct the electrical facility grounding system in accordance with:

1. NFPA 780 Standard for the Installation of Lightning Protection Systems;
2. IEEE 142 Recommended Practices for Grounding of Industrial and Commercial Power Systems;
3. NEC (NFPA 70) National Electrical Code;
4. National Electrical Safety Code (NESC) C2;
5. USDA RUS Bulletin 1751F802 Electrical Protection Grounding Fundamentals; and

6. TXDOT electrical design standards and details.

Electrical Service. DB Contractor is responsible for all electrical power services, feeder and branch circuit components, apparatuses, and conductors. DB Contractor shall design and construct primary and emergency generator backup electrical service systems as needed to service the roadside toll collection system. DB Contractor shall design and construct all electrical service, feeder and branch circuits as per:

1. NEC (NFPA 70) National Electrical Code;
2. NFPA 37 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines;
3. IEEE C62.41 IEEE Guide on the Surge Environment in Low-Voltage (1,000 V and Less) AC Power Circuits;
4. USDA Rural Utilities Service (RUS) Bulletin 1751E-320 Emergency generating and charging equipment;
5. TxDOT electrical design standards and details;
6. NFPA 99 for generators in healthcare facilities;
7. Emergency Power Supply System: NFPA 110, Level 2; and
8. Authority standards and equipment specifications.

DB Contractor shall provide a natural gas fired prime mover for the emergency backup generator and shall coordinate with the natural gas supplier to provide service to the emergency generator. Emergency generators shall be natural gas and shall be furnished with applicable piping, wiring, and regulators. Natural Gas Piping shall be in accordance with the Authority Special Specification Item 806. Design/Builder shall provide Supervisory Control and Data Acquisition (SCADA) interface as per SI requirements. At a minimum, the SCADA interface shall provide major and minor engine, generator and Automatic Transfer Switch control, status and alarms reporting.

Communications and Electrical Power Systems. DB Contractor shall be responsible for design and construction of communication and electrical power systems to support the installation of the toll collection system. DB Contractor shall design and construct at-grade conduit and duct bank systems for communication and power distribution systems. DB Contractor shall design and construct all at-grade conduit and duct bank systems as per the ITS Master Plan, TxDOT, SI and the Authority requirements, conceptual plans and drawings, at each proposed tolling location. The conduit and duct bank design and construction shall comply with the following standards:

1. USDA RUS Bulletin 1751F-640;
2. IEEE 62.64 Standard Specifications for Surge Protectors Used in Low-Voltage Data, Communications, and Signaling;
3. TxDOT electrical design standards and details
4. Authority Standards
5. Authority Roadway Electrical System Manual (RESM)
6. Executed DBA Documents;
7. NEC (NFPA 70) National Electrical Code
8. NESC C2 National Electrical Safety Code