TEXAS DEPARTMENT OF TRANSPORTATION

TECHNICAL PROVISIONS

SH 99 GRAND PARKWAY SEGMENTS H, I-1 AND I-2

STATE HIGHWAY 99

GRAND PARKWAY H&I

SEPTEMBER 1, 2016

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Attachment 5-1 – City of Dayton (Liberty County) Municipal Maintenance Agreement, (August 17, 1993)

Attachment 5-2 - City of Mont Belvieu (Chambers County) Municipal Maintenance Agreement (October 5, 2001)

Attachment 5-3 – City of Baytown (Harris County)Municipal Maintenance Agreement (April 15, 1968) including exhibits

Attachment 5-4 – Amendment to City of Baytown (Harris County) Municipal Maintenance Agreement, (November 13, 2013)

Attachment 5-5 – Amendment to City of Baytown (Harris County) Municipal Maintenance Agreement (April 24, 2013)

Attachment 5-6 – City of Patton Village Municipal Maintenance (Montgomery County) Agreement, (June 28, 1993)

Attachment 5-7 – Overpass Agreement Industry Track (Econorail) Agreement, Chambers County, Texas (August 1, 2003).

Attachment 5-8 – Underpass Agreement SH 146 Missouri Pacific Railroad (now Union Pacific Railroad) Spur Track to U.S. Steel Co. Plant Site East of Baytown, Texas, Control 389-12 (January 2, 1967).

Attachment 5-9 – Utility Agreement U1-4121, SH99: From FM 565 to FM 1405 (July 7, 2003).

Attachment 6-1 – Utility Forms

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Attachment 21-3 – Toll Zone Pavement Details

1 GENERAL

1.1 Project Scope

The Project scope components include the design, construction and maintenance of SH 99 Grand Parkway Segments H, I-1 and I-2, a two (2) to four (4)-lane toll facility in Harris, Montgomery, Chambers and Liberty counties in Texas (the Project). The limits of Segment H extend from the SH 99 Segment G terminus, crossing I-69/US 59 to US 90. The limits of Segment I-1 are generally from south of US 90 to south of IH-10 near Kilgore Road. Segment I-2 comprises two sections: I-2A and I-2B. The limits of Segment I-2A are generally from south of Kilgore Road to east of FM 1405. The limits of Segment I-2B are generally from east of FM 1405 to SH 146 in Baytown.

1.1.1 Base Scope 1

Base Scope 1 comprises the design, construction and maintenance of a four (4)-lane toll facility at the interface with Segment G, transitioning to a two (2)-lane section (one lane each direction) for the majority of Segments H and I-1 with passing lanes and is depicted in the Base Scope 1 Concept Plans. Segment I-2A is an existing four (4)-lane toll facility with non-contiguous frontage roads from south of I-10 southward to east of FM 1405. Work in Segment I-2A consists of the design, construction and maintenance of a grade separation at Fisher Road and the conversion of existing pavement to entrance and exit ramps to NB and SB SH 99, toll system and ITS conduit (duct-banks) and the installation of fiber optic cables for ITS and tolling. The Work in Segment I-2B comprises the design, construction and maintenance of a four (4)-lane toll facility between existing frontage roads, a portion of which are expected to be under construction by others through TxDOT projects CSJ 3187-01-005 and 3187-02-006 from BS-146E to FM 1405.

DB Contractor shall coordinate design work in the Toll Zones with TxDOT and shall follow the requirements of Section 21 - Tolling.

1.1.2 H-West Option

The H-West Option comprises the design, construction and maintenance of two (2) additional lanes to serve as EB mainlanes to accomplish the Ultimate Scope section from approximately sta. 1096+00 to sta. 1515+00 as depicted in the Concept Plans for H-West Option. DB Contractor shall reduce the inside shoulder of the WB mainlanes within these same limits to a four (4) foot width in accordance with the Ultimate Scope section.

1.2 Project Description

The Project is a proposed new-location two (2) to four (4)-lane toll facility within the ROW shown on the Concept Plans comprised generally of the construction of tolled lanes and passing lanes. A description of the Work is as described below.

1.2.1 Segment H

- Location: From US 59 North/I-69 to US 90
- Length: 22.5 miles
- Number of mainlanes: Two (one each direction)
- Frontage roads: Two discontinuous frontage roads (two lanes in one direction per frontage road)
- ROW width: 250-400 feet as depicted on the Concept Plans
- Direct connector bridges:
    - None
- Mainlane bridges:

  - White Oak Creek
  - Future Road 2G/US 59/I-69
  - Loop 494/UPRR
  - Future Thoroughfare #1
  - Caney Creek Tributary
  - Caney Creek
  - Baptist Encampment Road
  - FM 1485
  - Peach Creek/Wilderness Road
  - Galaxy Boulevard (planned)
  - Church House Gully
  - FM 1485 Turnaround/Westbound Frontage Road
  - East Fork of San Jacinto River
  - Cypress Hollow/Roots Down Road
  - Huffman-Cleveland Road
  - Future Thoroughfare #2 (Proposed Miller Wilson) (EB and WB)
  - Future Thoroughfare #3 (Proposed Community Drive) (WB)
  - Luce Bayou (WB)
  - Future Thoroughfare #3A (Proposed Wolf Trot) (WB)
  - Future Thoroughfare #4 (Proposed Kingwood Drive)
  - Cedar Bayou Tributary #1
  - Cedar Bayou Tributary #2
  - CR 622
  - East Fork of Cedar Bayou
  - FM 686
  - CR 621/UPRR
  - FM 1960
  - CR 605
  - Ditch Crossing #28
  - CR 603
  - Ditch Crossing #60
  - CR 602
  - US 90/UPRR (EB and WB)
- Frontage road bridges:
  - Peach Creek
  - Church House Gully (EB and WB)
- Ramp bridges:
  - None
- Cross street bridges:
  - None
- Turnarounds:
  - FM 1485 (W-E)
  - Wilderness Road (W-E)
  - FM 1485 (E-W)
- Tolling locations:
  - Mainlane Toll Gantry between Loop 494 and FM 1485
  - Ramp Toll Gantry on Galaxy Boulevard EB Entrance Ramp
  - Ramp Toll Gantry on Galaxy Boulevard WB Exit Ramp
  - Ramp Toll Gantry on Miller Wilson EB Exit Ramp

- Ramp Toll Gantry on Miller Wilson WB Entrance Ramp
- Ramp Toll Gantry on Community Drive EB Exist Ramp
- Ramp Toll Gantry on Community Drive WB Entrance Ramp
- Mainlane Toll Gantry between Huffman Cleveland Road and FM 686
- Ramp Toll Gantry on Wolf Trot NB Exit Ramp
- Ramp Toll Gantry on Wolf Trot SB Exit Ramp
- Ramp Toll Gantry on FM 686 NB Exit Ramp
- Ramp Toll Gantry on FM 686 SB Entrance Ramp
- Ramp Toll Gantry on FM 1960 NB Exit Ramp
- Ramp Toll Gantry on FM 1960 SB Entrance Ramp

1.2.2 Segment I-1

- Location: From US 90 to I-10
- Length: 14.8 miles
- Number of mainlanes: Two (one each direction)
- Frontage roads: Two discontinuous frontage roads (two lanes in one direction per frontage road)
- ROW width: 300-400 feet as depicted on the Concept Plans
- Direct connector bridges:
  - None
- Mainlane bridges:
  - Ditch Crossing #34/Dayton Canal
  - West Prong of Old River
  - Future Thoroughfare #5A
  - FM 1413
  - Ditch Crossing #40
  - Future Thoroughfare #5 B/Future Rail Spur
  - Future Thoroughfare #5C/Future Rail Spur
  - Industrial Spur/UPRR/Lynchburg Canal
  - SH 146 (EB and WB)
  - FM 565(EB and WB)
  - Future Thoroughfare #6
  - I-10
  - Kilgore Road (NB and SB)
  - Future Thoroughfare #7
- Frontage road bridges:
  - None
- Ramp bridges:
  - FM 1413 NB Entrance Ramp
  - FM 1413 SB Exit Ramp
- Cross street bridges:
  - None
- Turnarounds:
  - South of FM 1413 (S-N)
  - FM 565 (N-S)
  - Future Thoroughfare #6 - Langston Road (N-S and S-N)
  - I-10 (S-N and N-S)
- Tolling locations:
  - Ramp Toll Gantry on FM 1413 NB Entrance Ramp
  - Ramp Toll Gantry on FM 1413 SB Exit Ramp

- Mainlane Toll Gantry between FM1413 and SH 146
- Ramp Toll Gantry on SH 146 NB Exit Ramp
- Ramp Toll Gantry on SH 146 SB Entrance Ramp
- Ramp Toll Gantry on North FM 565 NB Exit Ramp
- Ramp Toll Gantry on North FM 565 SB Entrance Ramp
- Ramp Toll Gantry on Kilgore Road NB Entrance Ramp
- Ramp Toll Gantry on Kilgore Road SB Exit Ramp

1.2.3 Segment I-2A

- Location: From I-10 southward to just east of FM 1405 (Existing facility)
- Length: 8.7 miles
- Number of mainlanes: Four (two each direction)
- Frontage roads: Two discontinuous frontage roads (two lanes in one direction per frontage road)
- ROW width: Varies 300-400 feet
- Direct connector bridges:
  - None
- Mainlane bridges:
  - Econo Rail (existing)
  - Fisher Road (NB and SB)
  - Bridge at station 517+54 (existing)
  - Canal (existing)
  - FM 565 (existing)
- Frontage road bridges:
  - None
- Ramp bridges:
  - None
- Cross street bridges:
  - None
- Turnarounds:
  - Econo Rail (E-W and W-E, both existing)
  - FM 565 (N-S and S-N, both existing)
  - Fisher Road (W-E future by others)
- Tolling locations:
  - Ramp Toll Gantry on FM 565 SB Exit Ramp (existing)
  - Ramp Toll Gantry on FM 565 NB Entrance Ramp (existing)
  - Mainlane Tolling Gantry between Fisher Road and FM 565 (existing)

1.2.4 Segment I-2B

- Location: From just east of FM 1405 westward to SH 146
- Length: 6.1 miles
- Number of initial mainlanes: Four (two each direction)
- Frontage roads: Two discontinuous frontage roads (two lanes in one direction per frontage road)
- ROW width: Varies 200-400 feet with exceptions as depicted on the Concept Plans.
- Direct connector bridges:
  - None
- Mainlane bridges:
  - Wyoming Street (EB and WB)
  - Goose Lake (widen existing bridges)

  - Lee Drive/Causeway Road (EB and WB)
  - ML Wismer Road
  - BS I46 (EB and WB)
  - Tri-Cities Beach Road (EB and WB)
  - Cedar Bayou (one existing, one currently under construction by others)
  - FM 1405 (EB and WB)
- Frontage road bridges:
  - None
- Ramp bridges:
  - None
- Cross street bridges:
  - None
- Turnarounds:
  - Lee Drive/Causeway Road (E-W and W-E)
  - BS 146 (both currently under construction by others)
  - Tri-Cities Beach Road (E-W future by others)
  - Tri-Cities Beach Road (WB Left Turn Lane future by others)
  - FM 1405 (E-W and W-E, both existing)
- Tolling locations:
  - Mainlane Tolling Gantry just east of FM 1405
  - Mainlane Tolling Gantry between Lee Drive and BS 146

1.3 Project Requirements

DB Contractor's design shall provide for a smooth transition from the Project scope of Work to the existing conditions at the tie-ins.

1.3.1 Compatibility with Ultimate Scope

The Ultimate Scope for Segments H and I-1, as defined in the FEIS, is a four-lane, rural, controlled-access toll road as depicted in the ultimate (4-lane) Concept Plans. The DB Contractor shall perform the Work in a manner- compatible with the Ultimate Scope and shall accommodate construction for future direct connectors and cross streets shown in the ultimate (4-lane) Concept Plans. The DB Contractor shall provide for a smooth transition to the Ultimate Scope and with the exception of transition areas from two (2)-lane to four (4)-lane sections, DB Contractor shall endeavor to minimize throw-away construction associated with improving the Project to meet the requirements of the future Ultimate Scope.

1.3.2 Specific Project Requirements

1.3.2.1 *Future Thoroughfares*

At future thoroughfares #1, and #4 as depicted on the Concept Plans, DB Contractor shall provide stub outs from the Project mainlanes for the future entrance and exit ramps on both sides of these future thoroughfares.

At future thoroughfares #2, #3, and at Huffman-Cleveland as depicted on the Concept Plans, DB Contractor shall design and construct ramps to allow future local access road connections between cross streets.

At bridges over Future Road 2G, as depicted on the Concept Plans, DB Contractor shall provide stub outs for future exit and entrance ramps.

1.3.2.2 *Frontage Roads*

DB Contractor shall design and construct frontage roads for the limits as depicted on the Concept Plans and described below:

- Segment H
  - WB and EB between I-69/US 59 NB Frontage Road and Loop 494
  - Along FM 1485 between Redbud Drive and Chiquapin Lane with access connections provided to existing cross streets and driveways as depicted on the Concept Plans.
  - At FM 1960 to maintain connectivity of CR 610.
- Segment I-1
  - NB and SB between future thoroughfare #6 (Langston Road) and I-10
- Segment I-2B
  - At Wyoming Street to intersection to maintain local access.
  - WB and EB between Lee Drive/Causeway Road and BS 146 to maintain existing roadway operations, with access connections provided to existing cross streets and driveways.
  - EB between Cedar Bayou and FM 1405 to maintain existing roadway operations, with access connections provided to existing cross streets and driveways.

1.3.2.3 *Access/Egress Ramps to/from SH 99 Toll Lanes*

DB Contractor shall provide access/egress ramps to/from SH 99 at the following locations as depicted on the Concept Plans:

- Segment H
  - EB Entrance Ramp east of I-69/US 59 NB frontage road
  - WB Exit Ramp east of I-69/US 59 NB frontage road
  - EB Exit Ramp and WB Entrance Ramp west of FM 1485
  - EB and WB Exit Ramps at Galaxy Boulevard
  - EB and WB Entrance Ramps at Galaxy Boulevard
  - EB and WB Exit Ramps at Huffman-Cleveland Road
  - EB and WB Entrance Ramps at Huffman-Cleveland Road
  - EB and WB Exit Ramps at Future Thoroughfare #2 (Miller Wilson)
  - EB and WB Entrance Ramps at Future Thoroughfare #2 (Miller Wilson)
  - NB and SB Exit Ramps at Future Thoroughfare #3 (Community Drive)
  - NB and SB Entrance Ramps at Future Thoroughfare #3 (Community Drive)
  - NB and SB Exit Ramps at Future Thoroughfare #3A (Wolf Trot)
  - NB and SB Entrance Ramps at Future Thoroughfare #3A (Wolf Trot)
  - NB and SB Exit Ramps at FM 686
  - NB and SB Entrance Ramps at FM 686
  - NB and SB Exit Ramps at FM 1960
  - NB and SB Entrance Ramps at FM 1960 with frontage road between FM 1960 and CR 610
- Segment I-1
  - NB and SB Exit Ramps at US 90 with connectivity to CR 491 as depicted on the Concept Plans

  - NB and SB Entrance Ramps at US 90 with connectivity to CR 491 as depicted on the Concept Plans
  - NB and SB Exit Ramps at FM 1413
  - NB and SB Entrance Ramps at FM 1413
  - NB and SB Exit Ramps at SH 146
  - NB and SB Entrance Ramps at SH 146
  - NB and SB Exit Ramps at FM 565
  - NB and SB Entrance Ramps at FM 565
  - NB Entrance Ramp at future thoroughfare #6 and NB frontage road between future thoroughfare #6 and I-10 WB frontage road
  - SB Exit Ramp at future thoroughfare #6 and SB frontage road between future thoroughfare #6 and I-10 WB frontage road
  - SB Mainlane ramp connection to existing pavement section south of Future Thoroughfare #7
  - NB Exit Ramp at Future Thoroughfare #7
  - Convert existing pavement and intersection at Kilgore Road to NB and SB Entrance Ramps and NB and SB Exit Ramps
- Segment I-2A
  - Convert existing pavement and intersection at Fisher Road to EB and WB Entrance Ramps and NB and SB Exit Ramps
- Segment I-2B
  - EB Entrance Ramp at Wyoming Street
  - EB andWSB Exit Ramps at Wyoming Street
  - EB Exit Ramp at Lee/Causeway Road
  - WB Entrance Ramp at Lee/Causeway Road
  - EB Exit Ramp at BS 146
  - WB Entrance Ramp at BS 146
  - EB Entrance Ramp at Tri-Cities Beach Road
  - WB Exit Ramp at Tri-Cities Beach Road
  - EB Exit Ramp at FM 1405
  - WB Entrance Ramp at FM 1405

1.3.2.4 *Local Access Roadway*

DB Contractor shall provide local access roadways to maintain local street access or adjacent property access impacted by ROW acquisition for the Project at the following locations as depicted on the Concept Plans:

- Community Drive connectivity to I-69/US 59 NB frontage road
- Lake Drive connectivity to Walnut Drive east of Caney Creek
- Coastal Water Authority Canal Luce Bayou Interbasin Transfer Facility top of bank service road access route under Future Thoroughfare #3A (Wolf Trot Road) Overpass
- Coastal Water Authority's Northwest Lateral Canal north of FM 565, top of bank service route u-turn

- Coastal Water Authority's Barbers Hill Canal south of FM 565 Canal levee access route under FM 565 Overpass

1.3.2.5 *Passing Lanes*

DB Contractor shall provide passing lanes, achieved by providing the Ultimate Scope section (a four (4)-lane divided facility) at the following locations exclusive of transitions:

- From interface with Segment G west of I-69/US 59 for a minimum distance of 1.5 miles
- From east of Huffman-Cleveland Rd to north of Future Thoroughfare #3 for a minimum distance of 2.3 miles
- From north of US 90 to south of Dayton Canal for a minimum distance of 1.5 miles
- From south of SH 146 to north of I-10 for a minimum distance of 2.6 miles

1.3.2.6 *Cross Streets*

DB Contractor shall design and construct the following cross streets to their ultimate section in accordance with requirements of Section 11, within the SH 99 ROW limits:

- FM 1485 at Redbud Drive
- Wilderness Road
- Future Galaxy Boulevard
- Future Thoroughfare #2 (Miller Wilson)
- Future Thoroughfare #3 (Community Drive)
- Future Thoroughfare #3A (Wolf Trot)
- FM 1960
- FM 565
- Future Thoroughfare #6 – Langston Road
- Wyoming Street
- Lee Drive/Causeway Road
- ML Wismer Drive

The following cross streets shall have intersections with proposed ramps or frontage roads designed and constructed to intersect with the existing cross street roadway:

- Loop 494
- Huffman-Cleveland Road
- FM 686
- CR 491
- SH 146
- Business 146 (under construction by others)
- Tri-Cities Beach Road (under construction by others)
- FM 1405

DB Contractor shall reconstruct FM 1413 to provide for raising the elevation as needed for the SH 99 ramp bridges to cross over Big Ditch Canal. DB Contractor shall design and construct the roadway to provide for the existing number of lanes and left turn movements at SH 99 ramps, and to allow future widening to the ultimate section.

The following cross streets are to remain operational across the Project ROW in their existing condition:

- Baptist Encampment Road
- Cypress Hollow
- Roots Down Road
- CR 622
- CR 621
- CR 605
- CR 603
- CR 602
- Future Thoroughfare #7
- Kilgore Road
- Fm 1405
- Fisher Road (constructed by others)
- Business 146 (constructed by others)
- Tri-Cities Beach Road (constructed by others)

1.3.2.7 *City of Mont Belvieu*

DB Contractor shall coordinate with the City of Mont Belvieu concerning the following three cross street intersections in Segment I-1:

- SH 146
- FM 565
- Langston Road

DB Contractor shall provide for the following commitments with the City of Mont Belvieu (the "City" as used in this Section:

- Expanded use of pavers at the three intersections in Segment I-1 at the City's expense for a maximum value not to exceed $124,000.
- Identification of opportunities for additional landscaping to be designed, constructed and maintained at the City's expense.
- Blank sections of retaining wall for the first 100 feet of wall past the bridge abutments and underneath bridges at the three Segment I-1 intersections for future aesthetic treatment at the City's expense.
- Opportunity to add future aesthetic treatment at the end of the bridge substructure caps at the City's expense.
- The City shall provide a minimum of three acre-feet of detention for use by the State at no cost to the State or DB Contractor in the City's regional detention facility planned and being developed east of SH 99 and north of future Langston Road. Access to the detention site is available to the DB Contractor from FM 3180.
- The City will allow the DB contractor access to up to 300,000 cubic yards of borrow material from the City's proposed regional detention facility at no cost to the State or DB Contractor for the material. The City nor the State make no guarantee of the suitability of the material for use of the borrow material on the Project. DB Contractor shall be responsible for excavating, hauling,

and placement of material and for all testing to verify suitability of use for these borrow materials. DB Contractor shall also be responsible for obtaining City's approval for lines and depths of excavation and for maintaining appropriate site drainage and storm water pollution controls on borrow site.

1.3.2.8 *Removal of existing UPRR Lift Bridge over Cedar Bayou and rail crossing over SH 99*

DB Contractor shall remove the existing rail bridge structures over Cedar Bayou (existing lift bridge), located south of SH 99, and over SH 99 just east of ML Wismer Road, both in Segment I-2B, and as noted on the Concept Plans. The railroad track shall be removed by others. All track materials not removed by others, all ballast, and other rail materails within the bridge limits, and all bridge elements including substructure and superstructure shall be demolished and removed by DB Contractor.

DB Contractor shall remove substructure including but not limited to abutments, bents and associated foundations, of the existing UPRR industry spur over SH 99 to a minimum of five feet below finished grade or as necessary to provide for proposed SH 99 construction. DB Contractor shall not remove the bridge until UPRR provides written approval for removal and the proposed date to begin removal.

DB Contractor shall remove and dispose of all superstructure elements of the existing lift bridge from abutment to abutment including the lift span and trestle. DB Contractor shall remove and dispose of all of the existing lift bridge substructure including but not limited to abutments, bents, and associated foundations to a minimum of five feet below the mud line or in accordance with any requirements of the U.S. Coast Guard and any applicable permit requirements. DB Contractor shall be responsible for environmental studies, wetland studies, and permitting activities and coordination with applicable jurisdictional agencies, as required, to accomplish demolition and removal. Any hydraulic drainage design and modeling benefits for removal of the structure within Cedar Bayou downstream of SH 99 may be recognized in the hydraulic studies and drainage design applicable to the Project.

1.3.2.9 *Future Industry Rail Yards at Industrial Spur/UPRR/Lynchburg Canal*

The roadway and associated structures at the crossing of the Industrial Spur/UPRR/Lynchburg Canal from Station 2690+00 to Station 2737+00 shall provide for the opportunity for future rail yard and industry track spurs to cross under the roadway from Station 2691+20 to the UPRR ROW and from the UPRR ROW to the Lynchburg Canal north ROW limit. DB Contractor shall coordinate with TxDOT, the landowner(s), and private rail yard operator to provide envelopes between substructure units for future yard tracks as depicted on Proposed Substructure for Rail Yard Exhibit in the RID. Modifications to location of proposed substructure units is permissible with approval of TxDOT subject to coordination with landowner(s) and private rail yard operator. Horizontal clearance of 15 feet minimum shall be provided for substructure columns and adjacent rail tracks. DB Contractor shall design and construct roadway and structures to provide a minimum vertical clearance of 23'-4" above top of rail of the closest existing rail track. A lower top of rail elevation may be used if approved by the landowner and private rail operator.

1.3.2.10 *Special Utility Considerations*

- Segment H
    - Cell Tower located on north side of existing FM 1485 near Station 1314+00 will be allowed to remain within outer separation provided that all safety requirements are met, other requirements included in, but not limited to, the TxDOT *Access Management Manual* and TxDOT *Roadway Design Manual* are met, and the current owner is acceptable to signing a lease with TxDOT.

- Segment I-2B
  - Existing Centerpoint transmission towers located in TxDOT ROW can remain in place provided that the following conditions are met:
    - clear zone criteria is met or positive protection is provided,
    - height clearance from conductors is met,
    - all other UAR requirements are met, and
    - proper access is provided for Centerpoint to access and maintain towers.

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 components (PMP components) as described in Attachment 2-1. 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 Agreement and is a living document for the duration of this contract. The PMP shall include the representations in Exhibit 2 to the Agreement consistent with Section 1.2.2 of the Agreement. Within the timelines for implementing each component of the PMP, the plan shall include details of external auditing procedures.

DB Contractor shall include in the PMP all components described in Attachment 2-1, and shall meet the submittal requirements on Attachment 2-1.

DB Contractor shall ensure all commitments and requirements contained in the PMP are verifiable and shall allow TxDOT to audit the plans and monitor the activities described in the PMP at all times to assess DB Contractor performance.

2.1 Administrative Requirements

2.1.1 Project Schedule

2.1.1.1 *General Requirements*

DB Contractor shall create a complete and logical Project Schedule that represents the DB Contractor's plan for managing and executing the Work. The Project Schedule shall be used to: plan the work; define the timeframe for completion of the Project; provide milestones of major deliverables; monitor progress; facilitate progress payments; and to measure the impact of changes that occur during design and construction.

The scheduling software employed by DB Contractor shall be compatible with the current scheduling software employed by TxDOT as of the Effective Date (currently Primavera P6). DB Contractor shall provide an electronic file version of the schedule to be imported by TxDOT using TxDOT's scheduling software.

If separate short-term look ahead schedules are prepared using a different tool, DB Contractor shall submit these short-term look ahead schedules to TxDOT and assure they align accurately with the overall Project Schedule.

2.1.1.2 *Project Baseline Schedule (PBS)*

2.1.1.2.1 Staged Schedule Development

As the design is developed, it is intended that the Project Schedule represent the most accurate information known. Accordingly, a three staged schedule development process shall be used, as follows:

a) **Preliminary Project Baseline Schedule - PBS1**: Submitted with proposal.

b) **Project Baseline Schedule - PBS2**: The data date for PBS2 shall be the date of NTP1. DB Contractor shall use PBS1 as a foundation to prepare PBS2. The schedule shall be fully developed to the work breakdown structure (WBS) levels shown in Attachment 2-2 for the entire Project, and be cost loaded in accordance with Section 2.1.1.2.2.8. For the Project administration, ROW acquisition, design and Utility coordination WBS levels, the maximum activity durations will be 20 Days unless approved by TxDOT. No resource loading will be required for these WBS

levels. For the Utility relocation and construction WBS levels, the maximum activity duration will be 40 Days unless approved by TxDOT. No resource loading will be required for these WBS levels until PBS3. Upon acceptance, DB Contractor shall update PBS2 monthly until PBS3 is reviewed and accepted.

c) **PBS3:** PBS3 shall be submitted prior to any construction activities commencing. The level of detail to develop the schedule for the construction and Utility relocations WBS levels are shown in Attachment 2-2. For the construction and Utility relocation WBS levels, the maximum activity duration is 20 Days unless approved by TxDOT. The construction and Utility relocation activities shall be resource loaded in accordance with Section 2.1.1.2.2.7. PBS3, once accepted, will be the revised baseline schedule.

2.1.1.2.2 Schedule Requirements

The schedule shall include all major activities of Work required by the Contract Documents. It shall also include submittal activities and submittal review activities for TxDOT's and all third party reviews, such as for Government Approvals and Utility Owner reviews, which require an approval, acceptance, or concurrence.

The schedule shall indicate the sequence of performing each major activity and the logical dependencies and inter-relationships among the activities, and shall provide a sufficient number of activities to assure adequate planning to allow monitoring and evaluation of progress and, if applicable, payments.

2.1.1.2.2.1 WBS and Activity Coding

DB Contractor shall organize the schedule in accordance with the WBS presented in Attachment 2-2. Additional WBS elements and/or levels may be added with TxDOT's approval.

DB Contractor shall supplement the WBS organization with Project level activity codes that allow Project activities to be sorted by type of work, phase, location of work, and responsibility or as mutually agreed to by DB Contractor and TxDOT. Only Project level activity codes shall be utilized unless otherwise approved by TxDOT. If required, specific Project level activity codes shall be assigned as presented in Attachment 2-2 along with the required WBS.

2.1.1.2.2.2 Activities

For each activity in the Project schedule, DB Contractor shall:

a) Assign a unique identification number;

b) Provide a logical activity description so that the scope of work is identifiable and progress on each activity can be measured. The scope and location of the work shall be included in the activity description, and a list of abbreviations used in activity descriptions shall be provided by DB Contractor if requested;

c) Assign quantities of work to construction activities;

d) Provide a duration based on the quantity divided by a reasonable anticipated production rate and a list of anticipated production rates for major work elements. Inclement weather Days shall not be accounted for in the activity durations;

e) Include separate activities for cure time and assign to a cure calendar, unless otherwise approved by TxDOT;

f) Use the activity "Percent Complete Type" setting in P6 of "Physical Percent Complete", unless otherwise approved by TxDOT; TxDOT approval time should be set to calendar days and set to "Duration % Complete", as this is a set time of review; and

g) Assign a predecessor and successor relationship for each activity, except for NTP1 and Substantial Completion milestone(s).

2.1.1.2.2.3 Calendars

Through the use of calendars, DB Contractor shall incorporate seasonal weather conditions into the schedule, using a ten to 100 year average from the closest station provided by the National Oceanic and Atmospheric Administration (NOAA), for work that may be influenced by adverse weather conditions. A seven day/week cure calendar for curing activities shall be included. DB Contractor shall adequately represent non-work Days for activities with limitations such as Utility shutdown, work seasons, and landscape seasons. Non-work periods such as holidays shall also be incorporated.

DB Contractor shall set up all calendars as Project specific. Global calendars shall not be used unless otherwise approved by TxDOT.

2.1.1.2.2.4 Constraints and Milestones

DB Contractor shall identify each Completion Deadline with a milestone and assign a "Finish On or Before" constraint date. No other constraints are allowed without TxDOT approval.

DB Contractor shall include additional milestones in the schedule to define significant events such as Notices to Proceed (NTPs), start and finish of major segments/areas/regions of work, major traffic changes, and coordination points with outside entities.

2.1.1.2.2.5 Schedule Calculation Settings

The default schedule calculation settings in Primavera shall be used, except that critical activities shall be defined as the "Longest Path".

2.1.1.2.2.6 Float and Float Suppression

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. Float shall not be used to the financial detriment of either party.

DB Contractor shall not sequester float through the use of excessive lags, extended durations, calendar manipulation, intangible relationships, or any other such methodology.

2.1.1.2.2.7 Resource Loading and Leveling

For all construction activities, resources shall be incorporated at a crew level into the schedule when required. DB Contractor shall provide a list of crews separate from the schedule, and shall identify the composition of and production rate for each crew type. The crews shall be defined as a labor resource type and shall be assigned to appropriate activities.

The schedule option of leveling resources shall only be used with prior notification and concurrence of TxDOT.

2.1.1.2.2.8 Cost Loading and Cost Reporting Structure

DB Contractor shall utilize the Organization Structure for Cost Reporting provided as Attachment 2-3 to allocate the total contract amount to the lowest levels shown. Once reviewed and accepted by TxDOT, DB Contractor shall not change the cost allocation without written approval from TxDOT. Attachment 2-

3 shall be the same as the WBS level 3, and shall be used for reporting Project costs and developing draw requests.

DB Contractor shall cost load the schedule utilizing the breakdown and category amounts as agreed to in Attachment 2-3, and shall allocate the cost as follows:

a) No schedule activity shall exceed $1.0 million unless otherwise approved by TxDOT;

b) The costs shall not be allocated to "Level of Effort" or WBS summary type activities unless approved by TxDOT;

c) The costs shall not be allocated to TxDOT activities;

d) The costs shall be broken down in the level of detail for each individual control section job (CSJ) number, and provide the ability to roll up to the approved contract value for each CSJ; and

e) The costs shall not be artificially inflated, imbalanced, or front loaded when allocated to the activities.

DB Contractor shall submit procedures for addressing payment for unincorporated materials and cost loading modifications for TxDOT's review and approval.

2.1.1.2.3 PBS2 and PBS3 Narrative and Submission

DB Contractor shall prepare and submit a narrative report for the initial PBS2 and PBS3 submittals in accordance with the following requirements. Updates and revisions to these schedules have separate narrative requirements.

2.1.1.2.3.1 PBS2 Narrative Requirements

DB Contractor shall provide a schedule narrative that addresses the following in the order listed. The narrative shall:

a) Describe the plan and approach to each of the major elements of work: ROW acquisition, design, Utilities, additional third party coordination, construction, and tolling. A discussion of the schedule uncertainty shall be included in each of the major elements;

b) Describe the Critical Path;

c) Describe the activity identification naming convention and provide a guide to acronyms and abbreviations used in activity descriptions;

d) Provide a list of activities with durations exceeding the limits required in Section 2.1.1.2.1, as well as an explanation for using a longer duration. Activities exceeding the limits must have written approval from TxDOT;

e) Describe the approach to setting up the calendars used in the schedule, including adverse weather assumptions, and nighttime and shift work. The source of historical inclement weather data used in defining weather dependent work calendars shall also be provided;

f) Describe the milestones and constraints used and the completion dates as they relate to the Completion Deadlines in the Agreement;

g) Describe the use of leads and lags in the schedule;

h) Describe activity coding methodology;

i) Describe how resources were addressed in the schedule, as well as resource limitations. A comprehensive list of planned resources including number of crews, crew composition, and expected crew production rates shall be provided for all construction activities; and

j) Describe how the contract amount was allocated to the activities. A graph showing three cumulative cash flow curves shall be provided: one based on the early dates; one based on the late dates; and one based on the Maximum Payment Schedule.

As an attachment to the schedule narrative, DB Contractor shall provide the following for verifying the electronic copy of the schedule is the same as the schedule presented in the narrative:

a) 11 inches x 17 inches longest path plot in a Portable Document Format (PDF); and

b) Copy of the schedule calculation log in a PDF.

All schedule plots shall include: the Project title, the schedule file name, the data date, a page number, and a legend indicating the various symbols used and their meanings.

2.1.1.2.3.2 PBS2 Submission

DB Contractor shall submit PBS2 prior to, but not later than, the issuance of NTP2. DB Contractor shall submit the following with the PBS2 schedule:

a) One copy of the proposed Attachment 2-3 with the total contract amount allocated. In order to facilitate the schedule cost loading, this may be submitted prior to the schedule submission;

b) One electronic copy of the narrative report in a PDF; and

c) One electronic copy of the schedule in the Primavera .xer format.

2.1.1.2.3.3 PBS3 Narrative Requirements

DB Contractor shall provide a schedule narrative that describes the following in the order listed:

a) How resources were addressed in the schedule and any resource limitations, including a list of planned resources with number of crews, crew composition, and expected crew production rates;

b) The plan and approach to the construction of the Project and Utility relocations; and

c) The longest/Critical Path.

As an attachment to the schedule narrative, provide the following for verifying the electronic copy of the schedule is the same as the schedule presented in the narrative:

a) 11 inches x 17 inches longest path plot in a PDF; and

b) Copy of the schedule calculation log in a PDF.

Include on all schedule plots the Project title, the schedule file name, the data date, and a legend indicating the various symbols used and their meanings.

2.1.1.2.3.4 PBS3 Submission Requirements

Before the commencement of any construction work, DB Contractor shall obtain TxDOT review and acceptance of PBS3. DB Contractor shall submit the following with the PBS3 schedule:

a) The narrative report in PDF;

b) The narrative report without attachments in Word format; and

c) The schedule in Primavera .xer format.

2.1.1.2.4 TxDOT Review and Acceptance

TxDOT will review the schedule submittal and within 21 calendar days of submission, return it to DB Contractor as accepted, accepted with comments to be addressed in the following schedule update, or returned for resubmission within ten calendar days from the date of receipt by DB Contractor. DB Contractor shall repeat the submittal process until receiving TxDOT acceptance of the Project Schedule.

TxDOT's review and acceptance of the Project Schedule is for conformance to the requirements of the contract documents only and does not relieve the DB Contractor of any responsibility for meeting any completion deadlines. Review and acceptance does not expressly or by implication warrant, acknowledge, or admit the reasonableness of the logic or durations of the Project Schedule. If the DB Contractor fails to define any element of work, activity, or logic and TxDOT's review does not detect this omission or error, the DB Contractor is responsible for correcting the error or omission.

DB Contractor is solely responsible for planning and executing the Work and for providing sufficient materials, equipment, and labor to guarantee completion of the Project in accordance with the contract documents and completion deadlines.

2.1.1.3 *Schedule Updates*

2.1.1.3.1 Update Requirements

DB Contractor shall update the Project Schedule monthly with actual start and finish dates for completed activities, and physical percent complete and remaining durations for activities in progress. The data date for each schedule update shall be the day after the progress period for payments closes. Logic changes shall be implemented consistent with the retained logic method of scheduling to allow out-of-sequence work to proceed. DB Contractor shall submit the schedule update within five calendar days after the progress period for payment closes.

2.1.1.3.1.1 Acceptable Schedule Changes

Acceptable scheduling changes in an update include: logic adjustments to address out of sequence work and splitting of activities to address significant periods of inactivity for payment purposes.

DB Contractor shall not revise descriptions to represent a different scope than originally intended. No changes in activity durations, activity cost loading, calendar assignments, logic ties, or constraints will be allowed without TxDOT's written concurrence. These are considered schedule revisions. An activity identification number can only be used once. The DB Contractor shall not delete an activity, then create a new activity at a later date utilizing the same activity identification number.

2.1.1.3.1.2 Acceptable Cost Loading Changes in an Update

The splitting of activities for payment purposes will be allowed provided that justification is submitted, reviewed, and accepted by TxDOT. The DB Contractor shall ensure planned budget values match the total Project cost or revised total Project cost at all times.

2.1.1.3.2 Schedule Update Narrative and Submission Requirements

DB Contractor shall provide a narrative with each schedule update submittal. The narrative shall:

a) Include a comparison between last month's longest/Critical Path and current month's longest/Critical Path, with an explanation for any slippage or gains in Completion Deadlines;

b) Describe Work performed during the progress period with explanation of deviations between the Work planned or scheduled and the Work performed for the period, and explain any adjustments made to correct actual dates that were prior to the current update period;

c) Include a table of contract milestones and major interim milestones reflecting current completion dates compared to targeted completion dates;

d) Describe changes made to the schedule in terms of acceptability for an update and the affect the changes had on the Critical or near Critical Paths;

e) Include a look ahead at work to be accomplished during the next month, with a focus on Critical Path items; and

f) Include a description of potential Project issues that may impact the schedule. A discussion of the following shall be included: how critical each issue is and how much float it has; actions TxDOT could or needs to take to avoid or mitigate the issue; and DB Contractor's Plans on how to mitigate, avoid or resolve the issue. If requested, DB Contractor shall begin the Time Impact Analysis (TIA) process.

A discussion of problems or delay in the schedule update narrative shall not relieve DB Contractor of complying with contractual requirements regarding notification and documentation of claims.

DB Contractor shall include the following as attachments to the schedule update narrative:

a) Longest path schedule plot organized by WBS and sorted by early start in a PDF;

b) Schedule plot comparing DB Contractor's actual monthly progress to the previous month's planned progress, organized by WBS in a PDF;

c) Monthly expenditure projections in the Attachment 2-3 format;

d) Updated actual cumulative cash flow curve plotted along with the three cumulative cash flow curves: one based on the early dates; one based on the late dates; and one based on the Maximum Payment Schedule required in Section 2.1.1.2.3; and

e) Other layouts or reports as agreed upon or requested by TxDOT.

DB Contractor shall submit the following with the monthly schedule update:

a) The narrative report with attachments in a PDF;

b) The narrative report without attachments in Word format; and

c) The schedule in Primavera .xer format.

2.1.1.3.3 TxDOT Review and Acceptance

TxDOT will review the schedule update submittal within fourteen (14) calendar days of submission, return it to DB Contractor as accepted, accepted with comments to be addressed in the following schedule update, or returned for resubmission within ten (10) calendar days from the date of receipt by DB Contractor. DB Contractor shall repeat the submittal process until receiving TxDOT acceptance of the Project Schedule. Acceptance of the schedule update is required prior to payment of the associated Draw Request.

TxDOT's review and acceptance of the schedule update is for conformance to the requirements of the contract documents only and does not relieve the DB Contractor of any responsibility for meeting any Completion Deadlines. Review and acceptance does not expressly or by implication warrant, acknowledge, or admit the reasonableness of the logic or durations of the Project Schedule. If the DB Contractor fails to define any element of work, activity, or logic and TxDOT's review does not detect this omission or error, the DB Contractor is responsible for correcting the error or omission.

2.1.1.4 *Schedule Revisions*

2.1.1.4.1 DB Contractor Schedule Revisions

DB Contractor shall submit schedule revisions using a copy of the latest accepted update. DB Contractor shall not update and revise the schedule at the same time. All changes to the schedule, other than allowed in Section 2.1.1.3, will be considered revisions.

2.1.1.4.2 Change Order Revisions

Upon receipt of a request for a change proposal, DB Contractor shall incorporate the proposed change into a copy of the latest update using Steps 1 and 2 of the TIA process, provided in Section 2.1.1.6. The potential time impact which may result from the change shall be assessed by the DB Contractor.

DB Contractor shall allocate Change Order (CO) costs into the schedule update immediately following the execution date of the CO and assign to the "Change Modification" level of Attachment 2-3.

2.1.1.4.3 Recovery Schedule Revision

When required in accordance with Section 4.5 of the Agreement, DB Contractor shall prepare and submit a "Recovery Schedule" demonstrating the proposed plan to recover schedule slippage and to achieve the Completion Deadlines. The recovery plan shall be explained in writing and submitted in Primavera .xer format.

TxDOT will review the recovery schedule submission within fourteen (14) calendar days after submission and return it to DB Contractor as accepted, accepted with comments to be addressed in the following schedule update, or returned for resubmission within ten (10) calendar days from the date of receipt by DB Contractor. DB Contractor shall repeat the submittal process until receiving TxDOT acceptance of the recovery schedule.

2.1.1.4.4 Revision Submission Requirements

The following shall be submitted with the schedule revision:

a) A written revision analysis report providing the reason for the revisions, the scope and changes made to the schedule, and a description of the resulting effects on the schedule including any changes to the Critical or near Critical Paths;

b) Schedule plots and/or comparison analysis to the update prior to the revision showing the changes that were made in a PDF; and

c) The revised schedule in Primavera .xer format.

2.1.1.4.5 TxDOT Review and Acceptance

TxDOT will review the schedule revision or CO revision submission within fourteen (14) calendar days after submission and return it to DB Contractor as: accepted, accepted with comments to be addressed in the following schedule update, or returned for resubmission within ten (10) calendar days from the date of receipt by DB Contractor. DB Contractor shall repeat the submittal process until receiving TxDOT acceptance of the Project Schedule.

In the event the time impact of a CO revision cannot be agreed upon, DB Contractor shall continue tracking the change in accordance with Steps 3 and 4 of the TIA process and report findings.

2.1.1.5 *Time Impact Analysis*

DB Contractor shall submit to TxDOT a TIA as part of a Potential Change Order (PCO) Notice for an impact that may potentially cause Project delay as set forth in the contract documents and when requested by TxDOT for evaluating the potential time impact of COs under consideration.

If TxDOT requests a TIA, it shall be submitted by DB Contractor within 15 calendar days of receiving the request. Submission of a TIA does not relieve the DB Contractor of complying with all contractual requirements regarding notification and documentation of PCOs and actual COs.

Time extensions will only be considered when the total and Project float are absorbed and the Completion Deadline(s) is delayed.

Each TIA shall consist of the following steps:

Step 1. Establishing the status of the Project before the impact by using the schedule update with the closest data date prior to the impact, or as adjusted by mutual agreement to the date the impact began.

Step 2. Estimating the duration of the impact, determining appropriate logic, and insertion of the impact activity or activities into the schedule update used in Step 1, and predicting the effect of the impact on the schedule.

Step 3. Tracking the effects of the impact on the schedule during its occurrence. Identifying and measuring the effect of mitigation efforts taken by either the DB Contractor or TxDOT.

Step 4. DB Contractor shall establish the status of the Project after the impact is complete and identify any ongoing mitigation efforts being taken.

Steps 1 and 2 shall be submitted to TxDOT with a PCO, or as soon as there is constructive notice of a potential time impact. Step 3 shall be incorporated into schedule updates until the impact is complete. Step 4 shall be submitted to TxDOT no later than 30 calendar days after the completion of an impact. If Step 4 is not submitted within 30 calendar days, the issue will be considered as having no time impact.

A TIA shall consist of a report with accompanying schedules used in the analysis in Primavera .xer format. The report shall:

a) Identify the scope and timeline for the impact(s) being analyzed;

b) Identify the schedules used in the analysis;

c) Identify the schedule approach to modeling the time impact including the addition of activities, relationships, modifications to calendars, or application of constraints, and include a plot of the portion of the schedule showing the model;

d) Describe the impact or potential impact by comparing Step 1 to Step 2;

e) Describe the results of mitigation efforts taken through Step 3;

f) Describe any other potential mitigation efforts that may be taken to avoid impact;

g) Describe the status of the Project after the impact is over; and

h) Include schedule plots illustrating the analysis and documentation supporting dates, timelines, and entitlement.

2.1.1.6 *As-Built Schedule*

Upon completion of the Punch List, DB Contractor shall submit a final update which will be considered the as-built schedule.

2.1.2 Document Management

All electronic information submitted to TxDOT shall be searchable and legible. The PMP shall describe the controls exercised by the DB Contractor to ensure that: documents (including the PMP itself) undergo relevant review and approval prior to release; users have access to current versions of documents; versions of documents are identified; obsolete or superseded documents are so marked and prevented from unintended use; changes to documents undergo same level of review and approval.

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 Contract Documents using the applicable control section job (CSJ) numbers. 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 or earlier termination of the Agreement.

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 2-4 – I2MS Test Form Fields. DB Contractor shall coordinate with TxDOT to obtain the most current version of software prior to commencing construction quality acceptance testing. DB Contractor's 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, the 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 which TxDOT may require in connection with the Project.

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, the 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.

2.1.3 Progress Report

Each month, beginning with the first full month after NTP2, DB Contractor shall submit to TxDOT a monthly Progress Report. An electronic and printed copy of the entire Progress Report shall be submitted to TxDOT.

The Progress Report shall include, at a minimum, the Project Schedule Update narrative and the submission requirements described in Section 2.1.1.3.2 in addition to the following items:

(a) A list of any Change Orders that were identified or executed during the progress period and their status;

(b) Identification and status of issues that arose during the progress period and a summary of resolutions or issues that remain to be resolved;

(c) Status of Project ROW acquisition, and a description of the survey activity performed and condemnation support services provided as described in Sections 7.2.6, 7.3.1 and 7.4.4;

(d) Summary description of DB Contractor maintenance activities in accordance with Section 19.7; and

(e) Identification of requested and/or required TxDOT actions for the next month.

DB Contractor shall also provide digital progress photographs that accurately depict Project progress as outlined in the Progress Report narrative.

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.

2.2 Quality Management Plan

DB Contractor shall submit a comprehensive Quality Management Plan (QMP) to TxDOT for approval that is consistent with and expands upon the preliminary QMP submitted with the Proposal. The QMP shall comply with ISO 9001:2000 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.

The QMP shall be supported by the Design Quality Management Plan (DQMP), the Construction Quality Management Plan and the Maintenance Quality Management Plan. DB Contractor shall coordinate these distinct plans with one another such that common quality management system requirements such as document control, process auditing, and corrective and preventive action can be addressed with a single approach.

2.2.1 General Requirements

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

The QMP 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 QMP and the requirements of the Contract 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 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 Contract 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 Subcontractors.
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 QMP 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 Site.
d. Resumes for all quality management personnel.

2.2.4 Quality Policy

The QMP 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 Inspection and Testing

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

2.2.5.1 *TxDOT Inspection Notices*

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

2.2.5.2 *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 that DB Contractor shall submit to TxDOT within 24 hours following the inspection or test. Source documents for materials sampling and testing must be maintained and filed electronically. Any paper source documents (i.e. weights, measurements, calculations, etc.) scanned or converted to electronic files must be maintained.

b. The Construction Quality Acceptance Firm (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 CQAF's responsible technician and supervisor shall sign the daily inspection reports. The DB Contractor shall provide the results of the daily inspections 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 twenty-four (24) hours of test completion.
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 2-4. This electronic reporting is intended to allow the DB Contractor and TxDOT to make timely and accurate decisions on workmanship and material quality issues.

2.2.5.3 *Laboratory Requirements*

DB Contractor shall perform testing under the following circumstances, but not limited to:

a. The CQAF's testing laboratory identified in the Construction Quality Management Plan (CQMP) shall conduct DB Contractor's quality acceptance tests and shall comply with the requirements of the AASHTO Accreditation Program (AAP) or other appropriate accreditation acceptable to TxDOT for the pertinent test. DB Contractor shall transmit to TxDOT a copy of AAP accreditation certificate(s) upon receipt by the testing laboratory.
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.

2.2.5.4 *Supply Source and Material Quality*

DB Contractor shall ensure that the quality of all materials shall conform to requirements contained in the Contract 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.

2.2.6 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 Lead Quality Manager and quality assurance staff shall have no responsibilities in the production of the Work. Quality control staff shall only have responsibilities in the production of the Work and shall remain independent of the quality assurance staff.

DB Contractor's Lead Quality Manager 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 Lead Quality Manager, Design Quality Manager, Construction Quality Manager, and Construction Quality Acceptance Manager shall have the authority to stop Work for quality-related issues.

2.2.7 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 as detailed in the following subsections.

2.2.7.1 Released for Construction Documents

DB Contractor shall submit to TxDOT all Released for Construction Documents in accordance with the submittal requirements of the DQMP. DB Contractor's Released for Construction Documents shall comply with the requirements of the Contract Documents, and shall be detailed, complete, constructible, and shall allow verification of the design criteria and compliance with Contract Documents.

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

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

The DB Contractor shall furnish all Submittals by electronic copy in accordance with Section 2.1.2 of the Agreement. Unless otherwise stated in the Contract Documents, the DB Contractor shall provide to TxDOT four paper copies and a single electronic copy of each Submittal. Each Submittal shall have the signature of an authorized representative of the DB Contractor, unless otherwise expressly stated in the Contract Documents 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 Contract Documents.

The 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. Original Submittals 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 deliverables shall include a title block, consistent with the standard Project drawing format established as part of the QMP, with the following information:

a. Date of issuance and including all prior revision dates.
b. Contract title and number.
c. The names of the DB Contractor and applicable Affiliates.
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 the 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.
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.

2.2.7.2 Record Drawings and Documentation

Within 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.

2.2.7.3 DQMP General Requirements

The DQMP shall describe and include the following general requirements:

a. The quality control and quality review procedures for design 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 design 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 design 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 Contract Documents. The checking of structural design shall include a set of independent calculations, performed by the 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 design 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 design 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 Contract 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 Contract Documents.
f. Procedures shall be established for meeting documentation requirements; the filing of design criteria, reports and notes, calculations, plans, specifications, schematics 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.
g. Procedures and schedules for the Design Quality Manager to perform audits of the Design Firm's quality control procedures under the DQMP.

2.2.7.4 Design Quality Personnel and Staffing

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

Lead Roadway Design Engineer. DB Contractor shall assign a Lead Roadway Design Engineer who shall be responsible for ensuring that the design of the roadway is completed and design criteria requirements are met. The Lead Roadway Design Engineer shall be the Engineer of Record for the design of the roadway Elements and shall be a Registered Professional Engineer.

Lead Drainage Engineer. DB Contractor shall assign a Lead Drainage Engineer who shall be responsible for ensuring that the drainage design is complete, design criteria requirements are met and the drainage system functions as designed. The Lead Drainage Engineer shall coordinate with TxDOT Houston and Beaumont District Staff as well as Montgomery, Harris, Chambers and Liberty Counties on drainage related items. The Lead Drainage Engineer shall be the Engineer of Record for the design of the drainage Elements and shall be a Registered Professional Engineer.

Personnel reviewing Design. The DB Contractor's DQM shall designate personnel to perform the quality control check of the design. These individuals shall not be directly involved with the original development of the item, Element, or phase being checked.

2.2.7.5 Design Submittal Review Process

DB Contractor shall conduct a series of working meetings with its design staff, internal quality control staff and TxDOT to establish workflow processes and procedures, consistent with Contract Documents, to be utilized during the design review process. 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 (i) a list of proposed sections (i.e., station x+xx to station y+yy) for the Work; (ii) design packaging and content (such as drainage, individual structures, roadway, traffic sequencing, and others); (iii) a list of mandatory Submittals; and (iv) a proposed submittal schedule. The design reviews shall be evenly scheduled over the duration of the design 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 DQM 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 design products for general compliance with Project requirements, sound engineering practice, applicable Law, the Governmental Approvals and the Contract Documents. All Submittals are subject to review and comment.

If the DB Contractor and TxDOT cannot come to an agreement on the list of mandatory Submittals, the following list shall be provided at a minimum:

- Corridor Structure Type Study and Report
- Preliminary bridge layouts
- Preliminary Design Submittal
- Final Design Submittal

- Any deliverables described in the Technical Provisions
- Exhibits supporting railroad agreements
- Design Exceptions and Design Waiver requests

2.2.7.6 Final Design Submittal

The Final Design Submittal shall be submitted to TxDOT for general review and the DQM shall provide the required certifications. 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's concurrence of such a design, the DQM shall certify that:

a. The design meets all applicable requirements of the Contract 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.
d. DB Contractor has obtained all required Project ROW, Governmental Approvals, and Utility Owner approvals.

The Final Design Submittal shall consist of 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.

Prior to certifying the above items, Elements, or phases, and upon review and comment of the Final Design Submittal by the TxDOT, DQM shall schedule a formal review with TxDOT as described in Section 2.2.7.7.

2.2.7.7 Formal Review

DQM shall conduct a formal review presentation to TxDOT at a location acceptable to TxDOT. The formal review presentation shall be held following TxDOT's review and comment of the mandatory Submittals.

At least five (5) Business Days prior to the applicable formal review presentation dates, DB Contractor shall 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 DQM within five (5) Business Days after completion of each review.

2.2.7.8 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, DQM shall 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.

2.2.7.9 Certification of Compliance

Lead Quality Manager (LQM) shall verify that DB Contractor obtained approval from applicable Governmental Entities and Utility Owners prior to the issuance of a "certification of compliance" of the Design Documents by the DQM. Following issuance of a "certification of compliance" by the DQM, TxDOT shall review and provide written concurrence if merited.

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 the 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) Native electronic files
f) Documentation required for all Project ROW
g) Governmental Approvals
h) Utility Owner approvals

TxDOT's concurrence with the DQM's certification of compliance shall not constitute approval of the design or subsequent construction, nor 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 Contract Documents, applicable Law and Governmental Approvals.

Construction on any item, Element or phase covered by the DQM'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 2.2.7.11 – Early Start of Construction. Prior to 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 2.2.7.11. Any items, Elements or phases of design, subsequent to the certification of compliance from DQM, shall be checked and certified by the LQM in the same manner indicated above.

If TxDOT determines that the Final Design Documents do not meet the requirements of the Contract Documents, applicable Law and/or the Governmental Approvals, TxDOT 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's oversight reviews or problems during construction, TxDOT may, at its sole discretion, withhold payment for design and construction until sufficient DQMP 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.

2.2.7.10 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 need for clarity or when field changes occur, 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, an experienced 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 an experienced Registered Professional Engineer. In all cases, the DQM shall certify in writing that the design change has been:

a. Designed in accordance with the requirements of the Contract 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 for all design changes made during construction or to the Final Design Documents. 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 Record Drawings.

2.2.7.11 Early Start of Construction

The following sets 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 DQM'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 DQM has issued a certification of compliance and TxDOT has issued a written concurrence therewith.

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

Any Work constructed by DB Contractor prior to receiving TxDOT's concurrence of the Final Design Submittal for the Work, and later determined not to be in compliance with the requirements of the Agreement 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(s).

TxDOT and DB Contractor shall agree on procedures for Early Start of Construction. These procedures shall among other things, include a process for review and comment by TxDOT and a process for distributing Construction Documents signed and sealed by a Registered Professional Engineer to TxDOT and DB Contractor's field staff. 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 the DB Contractor. 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:

a) Horizontal and vertical drainage system
b) Typical sections
c) Related Elements of the drainage system
d) Related Elements of the traffic control plan specifically applicable during the term of the Early Start of Construction scope
e) Subsurface geotechnical investigations and recommendations
f) Slope stability analysis and recommendations
g) Preliminary structure general plans (if a structure is within the Element or portion of the nonstructural Work)
h) Settlement monitoring program
i) 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 2.2.7 (DQMP). 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.

2.2.8 Construction Quality Management Plan

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

DB Contractor's Construction Quality Management Plan (CQMP) shall contain detailed procedures for the 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* as well as the TxDOT's *Quality Assurance Program for Design-Build Projects with an Optional 15-Year Capital Maintenance Agreement* 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, Suppliers, 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 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 staff members shall be included, and the experience/knowledge/skill levels of the quality control support staff shall be stated.
f. CQAF organizational and staffing plans. DB Contractor shall (a) show the period of time that the quality acceptance staff member will be present on the Site; (b) include the resumes of key staff members; and (c) state 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. DB Contractor shall identify the administrative/clerical support staff for maintenance and management of records/documents pertinent to quality acceptance for the CQAF activities.

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. Sampling and testing requirements of all materials during the production or manufacturing processes.
i. 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.
j. 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.
k. 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, Construction Quality Manager (CQM), as defined in Section 2.2.8.1, and TxDOT. Procedures to proceed beyond inspection points shall be developed.
l. Description of specific procedures to ensure that all Work conforms to the requirements of the Contract 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.
m. Documentation 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.
n. Measures to ensure that purchased materials, equipment, and services conform to the Contract Documents, and Governmental Approvals, applicable Laws, Rules, 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.
o. 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.
p. Procedures to ensure that materials, equipment or Elements of the Work that do not conform to requirements of the Contract 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.
q. Procedures for processing a Request for Information (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 and TxDOT.
r. 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.
s. A program for inspection for each operation of all Work examinations, measurement and test of materials or Elements of the Work to assure quality.

t. A program for coordination of all inspection and testing with the inspections and tests of Governmental Entities and Utility Owners.
u. 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 Contract 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 shall track its testing frequencies to ensure compliance with the Contract Documents.
v. 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.
w. 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 following Good Industry Practice.
x. Procedures to control the handling, storage, shipping, cleaning and preservation of materials and equipment to prevent damage or deterioration.
y. Procedures to ensure that 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.
z. 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.
aa. 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 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.
bb. The requirements and methods for controlling documents. DB Contractor's document control system shall be compatible with TxDOT's.
cc. Procedures and personnel to be used to assure that specified instrumentation is installed and monitored in accordance with applicable specification.
dd. The form and distribution of certificates of compliance.
ee. 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.

Construction Quality Personnel and Staffing

2.2.8.1 *Construction Quality Manager (CQM)*

DB Contractor shall assign an on-site Construction Quality Manager (CQM) who shall be responsible for management of the quality assurance of the construction aspect of the CQMP. The CQM shall not be involved with scheduling or production activities, and shall report directly to DB Contractor's management team. The CQM shall ensure that the methods and procedures contained in approved CQMP are implemented and followed by DB Contractor and Subcontractors in the performance of the Work.

2.2.8.2 *Construction Quality Control Staff*

The DB Contractor's and Subcontractors' construction work forces are considered to be members of DB Contractor's quality control staff as each and every member is responsible for the quality of the Work. Personnel performing QC inspection 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 the DB Contractor, but cannot be employees of the CQAF.

2.2.8.3 *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 in Texas 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.

2.2.8.4 *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 staff. 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. CQAF test results shall be the basis for materials acceptance if, and only if, they are validated by TxDOT or their agent as part of the owner verification testing and inspection program as defined in TxDOT's *Design-Build Quality Assurance Program Implementation Guide* (DB QAP).

2.2.8.5 *Construction Quality Acceptance Staff Levels*

The size of the construction 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 shall perform quality acceptance oversight, inspection, and testing services typically performed by TxDOT on traditional projects, with the exception of monitoring and 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 of each segment and Final Acceptance deadlines.

If TxDOT determines that DB Contractor is not complying with CQMP because of lack of staff, TxDOT shall have the right, without penalty or cost to TxDOT, 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.

2.2.9 Maintenance Quality Management Plan(MQMP)

The MQMP shall capture all O&M Work performed by DB Contractor and its subcontractors and shall contain detailed procedures for the DB Contractor's quality control activities including a complete description of the quality policies and objectives that DB Contractor shall implement throughout its organization. The policies shall demonstrate DB Contractor senior management's commitment to implement and continually improve the quality of maintenance services.

The MQMP shall contain detailed descriptions of the inspection and test plans, including the timing and frequency of testing, as well as detailed systems and procedures for the following:

- Control of quality records;
- Management reviews;
- Resource allocation;
- Measurement of customer satisfaction;
- Control of nonconforming products and services; and
- Internal audits.

DB Contractor shall revise its MQMP when its own quality management organization detects a repeating or fundamental non-conformance in the Work performed or in the manner the O&M Work is inspected or tested, or when TxDOT advises DB Contractor of such non-conformance.

The MQMP shall be consistent with current versions of ISO standards relating to quality and audit as updated by the International Standards Organization. DB Contractor may elect to obtain formal ISO quality certification, but will not be required to do so.

Quality terminology, unless defined or modified in the TxDOT *QAP for DB Projects* or elsewhere in the Contract Documents, shall have the meaning defined in ISO 9001. Terms used in ISO 9001 shall have the meanings defined below:

- Organization - the DB Contractor's organization, including any Affiliates and Subcontractors

- Customers - the Users of the roadways, TxDOT, Customer Groups, and key stakeholders that have an adjacent property interest or connecting roadway
- Suppliers - Contractors
- Product - O&M Work
- Quality control - the part of quality management focused on fulfilling quality requirements
- Quality Management Plan - the MQMP

DB Contractor shall make all quality records available to TxDOT for review upon TxDOT's request and shall submit to TxDOT the results of all internal audits within seven Days of their completion.

Maintenance QC Manager shall be responsible to ensure the methods and procedures contained in approved MQMP are implemented and followed by DB Contractor and subcontractors in the performance of the O&M work during construction. Maintenance QC Manager shall be a Registered Professional Engineer.

2.3 Maintenance Management Plan

Section 19 (Maintenance) includes requirements for maintenance management.

2.4 Comprehensive Environmental Protection Plan

Section 4 (Environmental) includes requirements for environmental management.

2.5 Public Information and Communications Plan

Section 3 (Public Information and Communications) includes requirements for public information and communications.

2.6 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 concurrence 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 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 Agreement.

a) Safety Management

DB Contractor shall identify the personnel and staff responsible for implementing, maintaining, and enforcing 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. This position is responsible for executing the DB Contractor's Safety and Health Plan and all safety-related activities, including training and enforcement of safety operations. Requirements include:

- Roadway construction and safety enforcement experience

- A minimum of ten (10) years of progressive heavy construction experience, of which five (5) years must be safety management experience on complex heavy civil projects
  - Certification as either a construction health and safety technician (CHST) by the Board of Certified Safety Professionals or certification as a certified safety & health official (CSHO) may be substituted for two (2) years of safety management experience
- Completion of the OSHA #500 – trainer course in OSHA Standards for Construction
- Completion of the following training sponsored by an accredited agency
  - Work Zone Traffic Control
  - Flaggers in Work Zones.
- Completion of training and current certification for CPR and First Aid

The Safety Manager shall report directly to the DB Contractor's management team. 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, at 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 Agreement 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. At 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.

2.7 TxDOT-DB Contractor Communications Plan

DB Contractor shall submit to TxDOT for approval a TxDOT–DB Contractor Communications Plan (Communications Plan) that is consistent with and expands upon the preliminary communications plan submitted with the Proposal. DB Contractor shall maintain and update the Communications Plan throughout the Term.

The Communications Plan shall describe the procedures for communication of Project information between DB Contractor's organization and TxDOT.

The Communications Plan 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 Contract Documents.

2.8 Right of Way Acquisition Plan

Section 7 – Right of Way includes requirements for right of way acquisition management.

The Acquisition Survey Document prepared by the DB Contractor shall be reviewed by an independent Registered Professional Land Surveyor (RPLS) for consistency and compliance with all applicable Laws, standards, and requirements. The boundary location and the survey methods remain the responsibility of DB Contractor, and are not part of this review process. The reviewing surveyor shall review the survey document package and return his comments to DB Contractor in a timely manner. DB Contractor shall revise and correct the documents in accordance with the reviewing surveyor's comments in a timely manner. TxDOT will not accept the ROW Acquisition Survey Document as complete until the reviewing surveyor has signed and sealed the compliance certificate

2.9 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 occurring;
d) Proposed procedures and tools to conduct a risk sensitivity analysis;
e) Risk-mitigation strategies to eliminate or reduce specific risks.

2.10 TxDOT Offices, Equipment and Vehicles

Except where noted elsewhere, DB Contractor and TxDOT shall co-locate for the period of time commencing upon issuance of NTP1 and continuing thereafter through 180 days after Substantial Completion to facilitate Project coordination and daily communication. The definition of "co-locate" for this Agreement is Project Office space meeting the requirements of this Technical Provision that are near each other, along or adjacent to the Project and within five (5) miles of the Project ROW. At a minimum, the following DB Contractor's personnel shall be co-located with TxDOT:

- During the design phase: Project Manager, Design Manager, Lead Roadway Design Engineer, and Lead Bridge Design Engineer
- During the construction phase: Project Manager, Construction Manager , Construction Quality Manager and Construction Quality Acceptance Manager
- During the ROW acquisition phase: ROW Acquisition Manager

DB Contractor shall provide TxDOT office space that is in place, fully operational and available for occupancy;

- Core office space shall be available for move-in not more than sixty (60) Days following issuance of NTP1.
- Field office space shall be available for move-in either (a) not less than ten (10) days before work begins that requires the oversight from TxDOT personnel occupying the office space, or (b) not more than thirty (30) days following issuance of NTP2, whichever occurs first.

2.10.1 TxDOT Offices

The location, condition, floor plan layout, and amenities of the office space for TxDOT are subject to TxDOT's prior written approval. The TxDOT office space requirements for the Project Office, which includes the core office and field offices are provided below.

2.10.2 Computers and Equipment

The DB Contractor shall procure, install, and maintain the following computers, peripherals, and software for the TxDOT core and field office spaces; one computer with peripherals for each personnel office area and each reception area in the core and field offices. Not less than fifteen of the computers shall be laptops with docking stations. Peripherals for each computer shall include at a minimum, a power cable, a surge protector power strip, an ethernet cable of appropriate length, a mouse and an external keyboard, two flat panel monitors per computer, and one 16 gigabyte thumb drive.

The desktop and laptop computers shall be new systems with at least a one-year manufacturer's warranty. Minimum configuration for the desktop and laptop computers shall consist of no less than: four (4) gb internal ram, 250gb hard drive, two (2.0) GHz dual core processors operating on a 64-bit platform. The system shall include not less than: internal wi-fi, graphics processor, audio card, an hdmi port and at least three USB ports. For every eight (8) computers, the DB Contractor shall provide one external DVD drive and one external hard drive with not less than two (2) terabytes of memory per external hard drive.

Each core and field office shall include the appropriate number of broadband wifi routers and boosters to service all of TxDOT's office space wirelessly.

2.10.2.1 <u>Computer Software</u>

Each computer shall be configured and tested with the following minimum ordinary software requirements. Brand names are provided as examples; equally capable and compatible software can be installed with TxDOT's prior approval. Latest version or latest edition software shall be defined as the latest commercially available software at the time of the execution of the DB Contractor's contract, or issuance of the first Notice to Proceed:

1. Windows 8.1 or latest edition of operating system
2. Microsoft Office Professional latest edition (Office, PowerPoint, Outlook, Excel)
3. Adobe Acrobat reader (latest version)
4. Google Earth (free version)
5. Internet Explorer and Google Chrome
6. Anti-virus software with latest updates
7. DVD software driver compatible with the shared external DVD drive
8. Software driver and backup software compatible with the shared external hard drive.
9. Document management software required to access the DB Contractor's client facing document library (as applicable).

The DB Contractor shall provide the following additional software packages for TxDOT's use. TxDOT shall direct the DB Contractor as to which computers these software packages are to be installed. During the course of the Project, the DB Contractor may be required to move one or more of these additional software packages between computers.

1. Four (4) copies of Bently's Microstation latest version
2. Four (4) copies of GeoPak
3. Four (4) copies of Adobe Acrobat Professional latest version

In lieu of DB Contractor provided personal computer/peripherals, ordinary software (excluding the additional software packages referenced above) and personal computer maintenance, the DB Contractor may propose and TxDOT may accept at its sole discretion a fixed monthly leaseback amount for each TxDOT project management staff provided personal computer setup, including peripherals and ordinary software. Leaseback cost shall not be less than $200 per month per computer setup.

2.10.2.2 Telephone System and Office Equipment

The DB Contractor shall provide, install, maintain and provide materials and supplies as required for the following office equipment for TxDOT's core and field office space:

1. One (1) touch-tone conference room speaker phone with separate corded speaker/microphone modules for each conference room, each with a status indicator, caller ID, access to all outside lines and conference call capability.
2. One (1) high-speed multi-function color photocopy machine capable of handling 11'x17" prints (Xerox Workcentre model 7775 or equal) for core office.
3. One (1) high-speed multi-function non-color photocopy machine capable of handling 11'x17" prints (Xerox Workcentre model 5765 or equal) for core office and one for field office.
4. One (1) facsimile transmission machine (if not integrated with the multifunction photocopier) for core office and one for field office.
5. One (1) color scanner capable of handling 11"x17" prints (if not integrated with the multifunction photocopier) for core office and one for field office
6. One (1) paper shredder or secure paper shredding service for core office
7. One (1) commercial grade three-hole punch for core office and one for field office
8. One (1) commercial grade GBC binder (or equal) for core office.
9. All office supplies including copier paper, toner, pens, pencils, notepads, staplers, tape and dispensers, three-ring binders, manila folders, and other miscellaneous office supplies for core and field offices.

2.10.2.3 Cable and Wiring

For each TxDOT core and field office the DB Contractor shall install and maintain all appropriate power and communication wiring for all DB Contractor provided desktop computers, laptops, wi-fi routers and boosters, multifunction copiers, fax machines, scanners, telephones, security equipment, and cable TV's, complete in-place and operational. The DB Contractor shall be responsible for all coordination with the primary service providers of broadband, telecom, and cable TV services.

The DB Contractor shall install and maintain complete voice/data communications cabling system, which includes but is not limited to the EMT conduit, bridle \rings, pull boxes, category 5e UTP cable, category 5e "RJ-45" UTP receptacles, category 3 "RJ-11" UTP receptacles, receptacle boxes, cover plates, and fiber optic cable. If DB Contractor can establish, to TxDOT's satisfaction, that alternate hardware and cabling can achieve the same or better levels of service as TxDOT deems necessary to effectively manage this Project, then DB Contractor can submit for TxDOT's approval an alternate plan for hardware and

cabling. DB Contractor can use fiber optic or copper cable as long as it is sufficient enough to adequately support the Project core offices and field offices. DB Contractor shall route, terminate, label and test all power, broadband, cable & other communication wiring. Voice and data provided and installed by the DB Contractor circuits shall be installed in coordination with TxDOT Department of Information Resources staff.

DB Contractor shall certify and state supplied components as functional before installation and will bear all responsibility for replacement of parts at work commencement and throughout the duration of the Project.

DB Contractor shall prepare test plan and submit before installation, test installed system and supply test results, and shall conform to all industry standard testing procedures.

DB Contractor shall terminate all category 5e UTP cable in 66M150 punch down blocks for voice cabling and shall terminate all category 5e UTP data cable in data patch panels within the wiring closet.

DB Contractor shall ensure that each drop shall contain two data ports with RJ45 connectors and two voice ports with RJ11 connectors. The DB Contractor shall place the drops in locations convenient to proposed equipment locations so that external cabling and cords do not create a tripping hazard.

DB Contractor shall provide all materials, as needed and required, and complete installation of the cable plant which shall include all cable, connectors, patch panels, equipment rack(s), patch cables, face plates, punch down blocks, fiber optic cable and other miscellaneous materials.

2.10.3 Core Office

DB Contractor shall provide all space, facilities, and support elements necessary to design, construct and maintain the TxDOT core office in accordance with the Contract Documents. DB Contractor shall provide office space, not to exceed 12,000 square feet, for TxDOT's Project management staff including, the Program Manager and other contract employees. 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 TxDOT with a preliminary office space floor plan no later than seven (7) Days after NTP1. TxDOT shall review and comment on required modifications to the layout within ten (10) days. DB Contractor shall submit a final office space floor plan within ten (10) Days of receipt of TxDOT comments. Prior to commencing construction of TxDOT's core office space, the DB Contractor shall submit for TxDOT's approval final wiring and circuitry plans, office furniture and equipment layout, a lighting plan, and a parking plan for TxDOT's project management and contract staff vehicles. DB Contractor shall have the TxDOT core office completely operational and ready for occupancy no later than sixty (60) days following NTP1. If however, the DB Contractor elects to commence work at the DB Contractor's risk and with TxDOT's concurrence prior to NTP1, the DB Contractor shall provide adequate core office facilities for TxDOT personnel who will be engaged in TxDOT coordination of the at-risk work.

2.10.3.1 <u>TxDOT Facility Area and Items Provided by DB Contractor</u>

DB Contractor shall provide separate office space for the exclusive use of TxDOT's 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 shall be reasonable regarding re-use of existing space within DB Contractor's office facility, providing the space is contiguous and workable in TxDOT's sole discretion.

2.10.3.2 <u>Office Condition</u>

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 DB Contractor-Related Entity.

2.10.3.3 Loss or Damage

If office spaces, related facilities, furniture or fixtures that are provided by the DB Contractor 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) 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) 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. The DB Contractor shall incur a cost of five hundred dollars ($500.00) per Day for every Day that the lost, damaged or stolen property is not replaced in its full, complete and operational condition, in order for TxDOT to secure a temporary solution until the DB Contractor completes the repair or replacement.

2.10.3.4 Office Facilities and Equipment

For the TxDOT facility area it provides, DB Contractor shall:

a. General. Secure facility space, obtain all permits, install and pay for all utility services including broadband and telecommunication, and maintain the facilities as part of the Work.
b. Access and Security. Provide separate TxDOT entrance/exit(s) from the secure office space, 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., server room, document storage, offices). DB Contractor shall provide software for maintaining access to these areas, which shall be owned and/or maintained by TxDOT's Project management staff.
c. 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 duplex receptacles reasonably spaced around the office, with minimum circuit capacity of twenty (20) amperes. At least one duplex receptacle shall be placed in the proximity of the electronic equipment in the work space so that power cords and data/comm cables do not create a tripping hazard. The DB Contractor shall provide TxDOT with a lighting and electrical layout of the office space for TxDOT's approval prior to construction or build out of the office space.
d. Janitorial, Trash, Recycling, and Secure Document Shredding 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 procure and pay for janitorial, recycling and secure document shredding services for the TxDOT facility area.
e. Exterior Maintenance. Maintain the exterior areas of office spaces, including access to parking areas.
f. 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.

g. 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, seven (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 and built-in ice machine, sink including waste disposer, microwave, and dishwasher. If the building does not have a general building vending area then the DB Contractor shall make available to TxDOT within its facility vending machines and a stand-alone ice machine. Break room/kitchen shall have storage closet (25 sq. ft.) and cabinets with drawers and counter tops. In the event that 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 breakroom and/or restrooms within the TxDOT facility area, the 12,000 SF TxDOT space allocations may be required to be increased to accommodate these spaces.

h. 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, seven (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. Temperature controls for TxDOT's core office space shall be placed in an appropriate location within TxDOT's secured area.

i. Code Requirements. Meet all applicable building and fire code requirements.

j. 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.

2.10.3.5 Space Requirements

Although actual spaces may vary slightly, the following nominal size requirements shall apply, and the typical TxDOT facility area shall include the following elements:

a. Offices. Enclosed offices for TxDOT's management staff (nominal 150 square feet each) 15 total with keyed locking door hardware.

b. Cubicles. Cubicle area spaces for administration staff (nominal 80-100 square feet each) 15 total; (power supply and data and communication lines to cubicles may be provided through power pole drops).

c. Conference Rooms. Three conference rooms (enclosed) two at nominal 12'x 20' (240 SF), one at nominal 12'x 30' (360 SF) and one assembly room (enclosed) at nominal 32'x45' (1,575 SF) All shall have dimmable lighting, minimum 60-inch flat panel monitor with VGA/HDMI accessibility in conference rooms, an overhead projector and screen in the assembly room with a minimum 120-inch diagonal projected image 1024 by 768 resolution; each conference room shall have one chair for every 24 SF of conference room space and a conference table of sufficient size for all chairs.

d. Reception Area. Receptionist space with waiting area with seating for 2 visitors (nominal 200 SF); minimum 46" flat panel monitor with VGA/HDMI accessibility; other furniture to be determined jointly by DB Contractor and TxDOT.

e. Work Room. Work room (nominal 150 SF) with 30-inch high plastic laminate wall-mounted counters (15 lineal feet of counter). Work room shall be located near the center of the facility, and in close proximity to the receptionist space.

f. Storage and Filing. One (1) lockable space for storage and filing, nominal 15'x20' (300 SF).

g. Server Room. One computer server room (150 SF) that has limited access and is locked via security card access. Server room shall be accessible via hallway entry not sharing any walls with

the exterior of the building, and have no windows, a non-static floor covering, a standard 7'-19" rack and at least three dedicated 20-amp power circuits and one 30-amp circuit. All patch panels (phone and data) shall be located within the designated server room. Temperature shall be maintained with a dedicated air conditioning/cooling system as defined above.

h. Parking Area. Parking area for at least forty (40) vehicles (30 staff/10 visitors) that is reasonably level (all-weather surface and all-weather access). A portion of the available parking area must accommodate an 8' vehicle height. If covered parking is available, no less than two covered parking spaces shall be made available to TxDOT.
i. 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.
j. Corridors. Corridors within the TxDOT facility shall have a nominal width of 54 inches.

2.10.3.6 Miscellaneous Requirements and Features

The following shall be provided as noted:

a. Flooring. Carpeted flooring (non-static in server room).
b. Entry Access. Entry to TxDOT areas by electronic door hardware card access (not keyed), with U.P.S. on locks (fail closed).
c. Electrical Outlets. Each office and conference room shall have two (2 data, 1 com Cat 5E) outlets per room, and one (2 data, 1 com Cat 5E) outlet per cubicle, as well as outlets at designated printer, fax and copier locations and any and all shared areas (i.e., workroom, storage room, etc.). All data/voice outlets shall be installed next to power outlets. Outlets shall be placed so that equipment connections requiring power cords, data or communication cables do not create tripping hazards.
d. HVAC. 24/7/365 HVAC as previously described.
e. Window Coverings. Horizontal mini-blinds (no drapes) for each exterior window.
f. Power Circuits. Provide dedicated electrical power circuits for copiers, and minimum of 6 duplex receptacles with three dedicated 20-amp circuits and one 30-amp circuit for the server room.
g. Fire Extinguishers. DB Contractor shall provide fire extinguishers, per fire code and fire marshal with jurisdiction.
h. 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 Agreement.
i. Vending Area. DB Contractor shall provide access to general building vending area.
j. Utilities. Initial installation and monthly expense of all utilities shall be paid by DB Contractor directly to the vendor.
k. Monthly Services. DB Contractor shall procure and pay directly to the vendor for janitorial, trash, recycling, and secure document shredding services.
l. Emergency Contacts. 24-hour emergency contact to DB Contractor.
m. Furniture. DB Contractor-provided allowance of $75,000 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.
n. Cable Television. Provide cable television connections and service to each flat screen television.

2.10.3.7 Items Not Required

The following items are not required:

a. Outside storage.
b. Electronic security system (other than electronic door access hardware).

2.10.4 Field Offices

DB Contractor shall provide field office space for the exclusive use of TxDOT's field construction staff for the Project as specified herein.

Subject to TxDOT's prior written approval, DB Contractor shall provide separate facilities for TxDOT's construction oversight, OVT&I, and resident engineer / inspection oversight staff located within the same complex as DB Contractor's field office(s). If DB Contractor elects to construct the Work using field offices other than the one specified, DB Contractor shall provide for TxDOT's exclusive use of corresponding facilities that are at least of the same quality as DB Contractor's counterpart management and field staff.

Prior to commencing construction of TxDOT's field office space, the DB Contractor shall submit for TxDOT's approval final wiring and circuitry plans, office furniture and equipment layout, a lighting plan, and a parking plan for TxDOT's project management and contract staff vehicles. DB Contractor shall provide the field staff facilities that are, complete, fully operational, and ready for occupancy by the date that is (i) at least ten (10) Days prior to starting any Work activity involving staff that will occupy the field staff facilities, or (ii) no later than thirty (30) Days following issuance of NTP2, whichever occurs first.

2.10.4.1 Office Condition

The field office(s) shall be in good and serviceable condition meeting all ADA and local government regulatory criteria for safe a workspace environment, at least of the same quality as those of DB Contractor's counterpart management and field staff, respectively 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 facilities to DB Contractor in essentially the same condition as when TxDOT occupied the facilities, except for reasonable wear and tear and except for alterations, loss, or damage caused by any member of DB Contractor-Related Entity.

2.10.4.2 Loss or Damage

If office spaces, related facilities, furniture or fixtures that are provided by the DB Contractor are destroyed, damaged or stolen during the Work, except as a direct result of willful misconduct of TxDOT or its personnel, DB Contractor shall, at its cost and within ten (10) 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) 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. The DB Contractor shall incur a cost of five hundred dollars ($500.00) per Day for every Day that the lost, damaged or stolen property is not replaced in its full, complete and operational condition, in order for TxDOT to secure a temporary solution until the DB Contractor completes the repair or replacement.

2.10.4.3 Field Office Facilities and Equipment

For the facilities it provides, DB Contractor shall:

a. General. Secure sites, obtain all site permits, install and pay for all utility services, and maintain the facilities clean and in good working order as part of the Work.

b. Access and Security. Provide separate buildings or trailers for TxDOT staff that include at least two entrances/exits, providing an 8' x 10' (minimum) covered entrance area, from each building or trailer. Each entrance/exit shall be secured with a door lock plus a deadbolt lock.
c. Lighting and Electricity. Include with all interior spaces overhead lighting meeting the requirements of the Occupational Safety and Health Administration (OSHA) and of building and electrical codes for office space. Each office space shall have at least two duplex receptacles. The minimum circuit capacity shall be twenty (20) amperes.
d. Janitorial and Trash Service. Provide daily janitorial service (except Saturdays, Sundays and Holidays) and maintain trash containers and trash pickup service. This shall include, but not be limited to, sweeping and mopping floors, cleaning the toilet, and lavatory and emptying wastebaskets.
e. Exterior Maintenance. Maintain the exterior areas of office spaces, including access to parking areas.
f. Accessibility. Meet all access requirements of the Americans with Disabilities Act, as amended (42 USC §§12101, et seq.).
g. Utility Service. Provide potable water, sewer service, broadband internet service, telephone service, and electricity to the field office facility.
h. HVAC. Provide heating, ventilation, and air conditioning (HVAC) systems capable of maintaining temperatures between 65 and 70 degrees Fahrenheit in all spaces through the year.
i. Code Requirements. Meet all local building and fire code requirements.
j. Disposal and Removal. Be responsible for disposal or removal of all DB Contractor-provided facilities and any site restoration Work as required.

2.10.4.4 Space Requirements

Although actual space requirements shall depend upon Work schedule and geographic locations of the field offices, a typical field office shall include the following elements:

a. Offices. Enclosed offices with lockable doors for TxDOT's construction representative, TxDOT-designated construction manager and four (4) other TxDOT or contract employees (6 offices at 150 square feet each).
b. Offices/Cubicles. Offices or cubicles for up to twenty (20) field engineer/inspection/ administration staff (60-80 square feet each).
c. Conference Rooms. One (1) enclosed conference room of not less than (350 square feet) and access to another common conference room (350 square feet).
d. Server Room. One (1) server room, matching the requirements of the core office server room.
e. Storage and Filing. Two (2) lockable spaces for storage and filing at each field office (a combined space of 200 square feet).
f. Equipment Storage. Clean inside storage space for equipment (80 square feet).
g. Tool Shed. Shed for small tools and equipment (outside) (200 square feet).
h. Site Amenities. A well-graded site for the office with access road, parking area, and security fence with lockable drive-in gates sufficient to enclose the office and parking area.
i. Staff Parking Area. A parking area for at least twenty-five (25) vehicles that is reasonably level (all-weather surface and all-weather access) within the boundaries of a security fence.
j. Visitor Parking Area. An all-weather level surface outside the security fence to accommodate visitor parking (all-weather surface and all-weather access-minimum of 2,000 square feet).
k. Security. A 24-hour security service or silent watchmen-type security system.
l. Exterior Lighting. Sufficient exterior security lighting that is automatically activated at low light levels to maintain two (2) foot-candles of lighting within the fenced field office site.
m. Window Security. Security bars on all exterior windows.

n. Laboratory Facility. A completed facility suitable to accommodate a functioning portable lab (approximately 2500 square feet).
o. Cultural Resources Storage. Sufficient space and covered facilities for any archeological or paleontological recovery operations (approximately 2,000 square feet).
p. Kitchen/Break Room. Each field office shall contain a 300 sq. ft. kitchen/break room with storage closet (25 sq. ft.), cabinets with drawers and counter tops. Kitchen shall be equipped as described above for the core office.
q. Restrooms. Two restrooms including toilets and sinks.
r. First Aid Facilities. Emergency first aid facilities.

2.10.4.5 Items Not Required

The following items are not required:

a. Laboratory Testing Equipment.

3 PUBLIC INFORMATION AND COMMUNICATIONS

3.1 General Requirements

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. DB Contractor shall provide copies of all materials to be presented to the public or the media to TxDOT for their review at least three (3) Business Days prior to dissemination.

3.2 Administrative Requirements

3.2.1 Public Information and Communications Plan (PICP)

No later than thirty (30) Days after NTP1, DB Contractor shall submit to TxDOT for approval a comprehensive Public Information and Communications Plan (PICP), based upon the 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. Submittal shall be in both hardcopy form and electronic format compatible with TxDOT software. TxDOT approval of the PICP shall be a condition of issuing NTP2.

DB Contractor shall include in its PICP strategies and tactics, specific timelines, and deliverables. The PICP shall include:

a. A detailed work plan;
b. Key issues anticipated to be addressed through the life of the Project;
c. Identified Customer Groups and specific plans to respond to their concerns and needs with respect to the Project;
d. How the public will be notified of construction, traffic detours and potential impacts;
e. Specific outreach and engagement activities and the frequency of those activities;
f. Communication tools and modes; and
g. DB Contractor's process for measuring the effectiveness of the PICP.

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

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

DB Contractor shall continually maintain the plan to ensure delivery of high-quality, well executed communications throughout the Term of the Agreement.

Together with TxDOT's designated point of contact for the local public information office, DB Contractor shall review the PICP on a no less than annual basis to forecast, plan and coordinate updates in the plan and strategies needed to effectively accomplish the stated goals and objectives. 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.

In developing the PICP, DB Contractor shall make 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 opportunities for input.
c. Respond promptly to public questions and issues.
d. Demonstrate to Customer Groups that the Project will be developed pursuant to a well-executed program.
e. Notify Customer Groups in advance of key Project ROW acquisition, construction and maintenance activities and communicate the potential impacts of these activities.
f. Provide public information which facilitates alternative trip planning during construction.
g. 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.
h. Build upon TxDOT's positive reputation as a good partner to the community.
i. Build upon the efforts of the successful communications program carried out during the environmental process and reinforce relationships with key stakeholders.
j. Implement a fully bilingual program in English and Spanish.

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

Public Information and Communications 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, interviews, media kits, news releases, telephone correspondence, newsletters, brochures, e-mail, hotlines, highway conditions reports (HCRs), dynamic message boards, Web alerts, public opinion polls/surveys, videos, display booths, presentations, public access information kiosks, 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 with Customer Groups as well as two-way communication.
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, sound 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, coordinate tours of the Project.

Media

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

b. Build on existing TxDOT media resources and/or create and develop advertising messages, including graphics, logos, and slogans.
c. Place Project-related messages in the appropriate media.
d. Develop and distribute public service announcements, paid advertising, news reports, and other communication materials as appropriate.
e. Manage media relations with key transportation and business reporters and prepare and distribute news releases and media kits.
f. 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 limits.
g. Employ the use of an internet based communications, media alert, press release and special list notifications system service that provides information in real time with an up to date database of major media contacts in the area and subscriber lists.

Environmental

a. The PICP shall detail the communication hierarchy for information distribution related to compliance with the Comprehensive Environmental Protection Program, as described in Section 4 (Environmental). The PICP shall include names and contact information, including emergency contact information, and the preferred methods of routine and emergency communication distribution.
b. DB Contractor shall assign audit and quality assurance responsibilities to a member of his quality assurance team. The Public Information Coordinator shall not perform audit and quality assurance responsibilities because of the potential conflict of interest.

3.2.2 Public Information Status Report

DB Contractor shall report back to TxDOT on the status of the PICP on a regular basis, as follows:

- **Weekly**: DB Contractor shall send TxDOT a high-level weekly status report of public information and communications activities electronically. The report will feature metrics such as how many stakeholder meetings were held, how many phone calls on the hotline, etc. The document will serve as an internal document to track progress.
- **Monthly**: DB Contractor shall create monthly a full color Project status report which provides essential information about the Project including a listing of upcoming Project related activities and events. This document will be tailored as a public document to be forwarded on to Customer Groups, elected officials, etc. DB Contractor shall provide an electronic copy of the monthly Project status report to TxDOT.

3.2.3 Public Information Coordinator

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

- 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.
- Lead the production, implementation and update of the PICP.
- Coordinate and supervise day-to-day activities of DB Contractor's personnel in performing the activities described in the PICP.
- Facilitate communication among DB Contractor, TxDOT personnel (including TxDOT's Public Information Officers), Customer Groups and Governmental Entities.

- Interact with Customer Groups and represent the interests of the Project at associated meetings and other formal and informal events.
- 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.
- Prepare public exhibits, audiovisual presentations, and regular updated materials (ex. fact sheets, maps, collateral material).
- 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.
- Coordinate with the TxDOT Beaumont and Houston District Public Information Officers regarding all media inquiries and outreach.

To implement the PICP, DB Contractor shall support the Public Information Coordinator by providing a staff with skills including graphic design and building informed consent.

3.2.4 Public Information Office and Hotline

DB Contractor shall maintain a public information office for the Term of the Agreement. The hours of operation for this office shall be in accordance with normal business hours Monday-Friday with extended hours of operation until 7:00 pm at least one day a week and from 9:00 am to Noon at least one Saturday every month to allow stakeholders access to the project information outside of normal business hours. 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, 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. These conference rooms shall be at a convenient and accessible location that facilitates attendance by Customer Groups. One of these rooms shall accommodate at least 50 persons and the other shall accommodate at least 15 persons.

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

Monday-Friday	8:00 am – 6:00 pm
Saturday	9:00 am – Noon
Sunday	Closed

If there is an emergency or a need arises to better serve the Customer Groups, hours of operation may be required to be extended.

In addition to the services listed above, DB Contractor shall provide a 24-hour telephone hotline, manned locally during normal business hours of the public information office, with a recorded bilingual message describing emergency procedures after hours. DB Contractor shall respond to voicemail messages left after hours within 24 hours of receiving the voicemail message. Hotline shall be live in advance of the start of any field investigation work near homes and all construction activity. Additionally, the Public Information Coordinator shall be accessible for response to the media and emergencies via a smart phone operable device at all times.

3.2.5 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. 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

3.2.6 Events

TxDOT wants to provide multiple opportunities for the public to be engaged in the Project in fun and informative settings including but not limited to:

Groundbreaking Ceremony: DB Contractor shall participate in a groundbreaking ceremony to mark the beginning of the construction of the Project. The event shall be comparable in scope to past TxDOT Beaumont and Houston District ground breaking events. At a minimum, DB Contractor shall supply the following elements for the groundbreaking ceremony: tents, chairs, stage, podium, sound system, ceremonial shovels, mementos, refreshments, invitations, and programs. TxDOT will determine the attendees, arrange speakers for the event and will handle execution of the ceremony. DB Contractor shall work with TxDOT to identify the location of the ceremony, assist with parking, logistics, and traffic control for the ceremony as directed by TxDOT.

Meetings with the Public and Customer Groups: DB Contractor shall organize and manage meetings with the general public and Customer Groups during design and construction activities.

DB Contractor's PICP shall address the frequency of meetings with the public and Customer Groups, and allow such frequency to increase or decrease as needs arise to better inform and engage the Customer Groups. DB Contractor shall propose a schedule of meetings with the general public to TxDOT and then conduct such meetings that, at a minimum, shall address Project construction and maintenance.

To maximize public participation, DB Contractor shall advertise public meetings with the general public with sufficient advance notice using electronic notices, flyers, Web postings, and in the appropriate media outlets, such as local newspapers, and television and radio stations. DB Contractor shall be solely responsible for meeting advertisement.

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 and relocation 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

DB Contractor shall notify TxDOT a minimum of 48 hours in advance of any meetings with the public (i.e., attendance to group/stakeholder meetings as an invited speaker/guest, topic specific meetings with key stakeholders, DB Contractor hosted meetings to discuss key issues/concerns related to the Project). 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 an easily updated format, 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.

Community Events: DB Contractor shall host or support a minimum of 30 community events (such as kids' day or neighborhood barbecue) during the life of the Project aimed at providing communities with opportunities to learn firsthand about the Project and to thank nearby residents for their patience during the construction process. These events targeting the local community shall include elements such as: construction safety presentations; information on the Project; hands on equipment demonstrations; giveaways; food and refreshments. DB Contractor shall be responsible for planning, advertising and executing the events in coordination with TxDOT. Depending on the specifics of the event, DB Contractor shall be responsible for providing construction equipment, personnel, giveaways, food and refreshments.

Grand Opening Ceremony: DB Contractor shall participate in a grand opening ceremony to mark the opening of the Project. The event shall be comparable in scope to past TxDOT Beaumont and Houston District grand opening events. DB Contractor shall plan and coordinate the grand opening ceremony in coordination with the TxDOT Beaumont and Houston Districts. At a minimum DB Contractor shall provide the following elements for the grand opening: tents, chairs, stage, podium, sound system, mementos, refreshments, invitations, and program, as approved by TxDOT. DB Contractor shall work with the TxDOT Beaumont and Houston Districts to identify the location of the ceremony, assist with parking, logistics, and traffic control for the grand opening ceremony as directed by TxDOT. TxDOT will determine the attendees, program, and speakers for the event and will handle execution of the ceremony.

3.2.7 Meeting Summaries

For all meetings with the Customer Groups 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.

3.2.8 Communication Tools

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, email, hotlines, dynamic message signs, Web alerts, social media, maps, displays, renderings, presentations, brochures, pamphlets, highway advisory radio and video news releases. Products and

deliverables intended for public dissemination of information related to the project shall be subject to review and approval by TxDOT.

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

a. DB Contractor 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. Newsletters
h. Event calendar
i. Materials presented at events
j. Links to other related sites as deemed appropriate by TxDOT
k. Comment form
l. Mailing list request form

Website design and creative development shall be coordinated with TxDOT to assure TxDOT brand management and concurrence.

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 Agreement 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 align with the TxDOT *Brand Management Guidelines*. Any exceptions will require approval by TxDOT.

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.

3.2.9 Lane Closure Notification

Subject to the Lane Closure restrictions set forth in Section 18 – Traffic Control, 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, and a minimum of 48 hours advance notice for Lane Closures that are planned to be in effect less than 24 hours, using all appropriate tools as needed. Tools shall include website updates, social media, and media outreach. In addition, DB Contractor shall be responsible for the rental and placement of portable messaging signs (dynamic and static) as required by the approved traffic control plan to alert the public to traffic impacts/road closures. DB Contractor shall ensure that messaging on the signs is current and accurate at all times. The Public Information Coordinator shall input all Lane Closures (or an event that results in Lane Closures) in accordance with the Houston District Highway Conditions Report (HCR) manual for the respective fiscal year. The Public Information Coordinator shall be responsible for advertising such closures via electronic notices, media releases, website and social media posts on, at a minimum, a weekly basis. Additional emphasis and efforts will be expected related to scheduled closures anticipated to have major traffic impacts and/or emergency situations that result in Lane Closures.

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.

3.2.10 Emergency Event Communications

For all Emergency events, 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 HCRs, TxDOT Beaumont and Houston District Office *Highway Advisory Reports*, emails/Web 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. 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.

3.2.11 Deliverables

DB Contractor's Public Information Coordinator shall provide a production schedule for all collateral materials (i.e., Project facts sheets, website page links, newsletters, displays, maps, circulars, etc.) that includes submittal of such collateral materials to TxDOT prior to the public release of each item.

DB Contractor may submit preliminary drafts, and shall submit all proposed final materials to TxDOT at a minimum of 36 hours prior to public release of each item for review and concurrence.

DB Contractor's Public Information Coordinator shall submit all media releases to TxDOT at a minimum of 24 hours prior to publication of such media release for TxDOT review. Media releases concerning emergency situations shall be submitted to TxDOT, but the release shall be published as quickly as may be warranted by the emergency situation.

Real-time electronic notices and social media postings/updates will be monitored by TxDOT as released.

4 ENVIRONMENTAL

4.1 General Requirements

The DB Contractor shall deliver the Environmental Commitments required by the RFP, Contract Documents, Environmental Laws, Governmental Entities, Governmental Approvals, and all applicable federal and State Laws and regulations. To that end, the 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 Environmental Commitments. The CEPP shall obligate the 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 the DB Contractor's knowledge of all applicable Project-specific Environmental Approvals, issues, and commitments and applicable Environmental Laws as 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, consistent throughout the Term of the Agreement as applicable to the activities being performed, and in accordance with the requirements set forth in the Environmental Laws. The CEPP shall also effectively describe the quality control and assurance measures that the DB Contractor will implement to verify the compliance of the CEPP 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, if violations occur, the CEPP shall set forth detailed processes for rectifying such violations in an appropriate and timely manner.

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

4.2 Environmental Approvals

4.2.1 New Environmental Approvals and Amended TxDOT-Provided Approvals

TxDOT-Provided Approvals are based on the Concept Plans as presented in the Environmental Approvals. As design and Work progresses, if any changes are made beyond what is specifically presented in the Environmental Approvals and/or existing agency coordination documentation, additional Environmental Approvals (to include, but not limited to, environmental reevaluations and/or additional agency coordination) may be required. Changes to the Concept Plans and/or the addition of (or changes to) right-of-way (for activities such as, but not limited to, design changes, temporary and/or permanent easements utilized for construction) not included in the Environmental Approvals and/or existing agency coordination documentation shall require reassessment.

DB Contractor shall be responsible to provide TxDOT all design-related information (to include, but not limited to, design plan sheets and .dgn files for the proposed design changes). TxDOT will be responsible for assessing whether the changes will require New Environmental Approvals and/or coordination with Governmental Entities. If TxDOT determines New Environmental Approvals are necessary, TxDOT will instruct the DB Contractor to provide all necessary documentation and/or submittals for the New

Environmental Approvals. If TxDOT determines coordination with Governmental Entities is necessary, TxDOT will instruct the DB Contractor to either coordinate with the Governmental Entity and/or provide all necessary documentation and/or submittals required to conduct the coordination.

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, in its discretion, provide assistance in securing New Environmental Approvals or amendments to TxDOT-Provided Approvals.

4.2.2 Responsibilities Regarding Environmental Studies

DB Contractor shall be responsible for conducting continuing environmental studies based on the Project approved NEPA documents and Concept Plans.

DB Contractor shall be responsible for conducting environmental studies and re-evaluations in accordance with Section 6.10.2 of the DBA. The 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.

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 Laws. TxDOT shall accept documentation meeting current submission standards. TxDOT shall return approved documentation to the DB Contractor for submittal to the appropriate Governmental Entity in cases where the DB Contractor performs coordination. TxDOT, acting reasonably, shall approve those submissions for which TxDOT signature or other approval is required. Documentation not meeting current submission standards or requirements of Governmental Entities will be returned to the DB Contractor, and shall be revised by the DB Contractor to meet standards or requirements.

4.2.4 TxDOT-Provided Approvals

The TxDOT-Provided Approvals are located in Exhibit 4 of the Agreement:

- The NEPA approvals for Segments H, I1, and I2 (Final Environmental Impact Statements (FEIS) H, I1and I2 Re-evaluation (I1), and Records of Decision (ROD)H, I1 and I2)
- Re-evaluations and/or revised Records of Decision (ROD) of the NEPA Approvals to be provided upon completion for Segments H, I1 and I2
- The U.S. Army Corps of Engineers Individual Permits (Section 404 and 401 Permits) for Segments H & I1.
- The U.S. Army Corps of Engineers NWP (Section 404 and 401 Permits) for I2 will be provided upon completion and issuance of a Permit(s) by the USACE Galveston District.
- U.S. Coast Guard Permit (Section 10) for I2.

4.3 Comprehensive Environmental Protection Program (CEPP)

As part of the PMP, the DB Contractor shall develop and implement a CEPP, applicable throughout the Term of the Agreement 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 system 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 mitigation. 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.

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 Plan (EPTP)
d. Hazardous Materials Management Plan (HMMP)
e. Communication Plan (CP)
f. Construction Monitoring Plan (CMP)
g. Recycling Plan (RP)
h. 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 for amendments to the PMP.

4.3.1 Environmental Management System (EMS)

The 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 internal 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, provided to appropriate field personnel, 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. Wetlands delineations and appropriate Section 404 Permit Application if changes to the design or temporary construction impacts are necessary;
e. Mitigation or resource monitoring reports, as required by resource-specific mitigation plans
f. Designs for wetland and floodplain mitigation;
g. Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit (TXR150000), Notice of Intent (NOI);
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 including verification of employee completion;
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 (EPICs will be included in each plan set provided to all field personnel);

o. Documentation of any right-of-way reduction considerations;
p. Copies of correspondence between DB Contractor and Federal, State, and local agencies;
q. All detour plans associated with the Project.

4.3.2 Environmental Compliance and Mitigation Plan (ECMP)

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 the 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 (EPIC) Sheets**

The DB Contractor shall develop and maintain EPIC construction plan sheets. DB Contractor shall identify applicable permits and Environmental Commitments on EPIC sheets and updated throughout the construction period to identify on-Site conditions.

EPIC sheets shall include the Environmental Commitments required to ensure that any discharge from the Site into a sanitary sewer system complies with appropriate codes and standards of the sanitary sewer owner.

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

The DB Contractor shall document how they will comply with the terms and conditions for Section 404 Individual permit(s) issued to TxDOT by the USACE and associated Section 401 State Water Quality Certification(s) as administered by the TCEQ (Texas Commission on Environmental Quality) as well as any additional USACE Individual 404 Permit(s) and 401 certifications issued to the DB Contractor during the life of the Project. The DB Contractor acknowledges that TxDOT-provided USACE Individual 404 Permit(s) are based on the Concept Plans and Preliminary ROW; consequently the USACE Individual 404 Permit(s) may require amending by the DB Contractor as the Work progresses. DB Contractor shall submit such amendments to TxDOT for review. 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 communicating the terms and conditions of all USACE Individual 404 Permit(s) and TCEQ 401 certifications and other permits as necessary,
c. Procedures for carrying out any required mitigation and/or avoidance areas,
d. Procedures for handling off-right-of-way Project Specific Locations (PSL) as required by all USACE Individual 404 Permit(s) issued to either TxDOT or the DB Contractor by the USACE.
e. Procedures for handling right-of-way Project Specific Locations (PSLs) as required by all Section 10 permit(s) issued to either TxDOT or the DB Contractor by the USCG.
f. Process to handle changes that may occur to USACE Individual 404 Permit(s) provided by TxDOT.

- **Clean Water Act - Section 402: Texas Pollutant Discharge Elimination System (TPDES)**

The DB Contractor shall document compliance with Section 402 of the CWA. The documentation shall include that the DB Contractor has day-to-day operational control over activities necessary to ensure compliance with the Storm Water Pollution Prevention Plan (SW3P) and has the sole responsibility for any potential non-compliance issue. The documentation shall also include that the 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 right–of-way and/or any changes to Concept Plans 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
d. Escalation procedures for SW3P items
e. Procedures for handling all applicable Municipal Separate Storm Sewer System (MS4) requirements.

- **State Listed Species and Unregulated Habitat**

DB Contractor shall address and document 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
b. Procedures for complying with any commitments.

- **Endangered Species Act and Fish and Wildlife Coordination Act**

DB Contractor shall document compliance with the Endangered Species Act (ESA) and the Fish and Wildlife Coordination Act (FWCA). The documentation shall reflect that TxDOT will conduct all coordination with U.S. Fish and Wildlife Service (USFWS). The documentation at a minimum shall include:

a. Process for training personnel on the requirements of the ESA and FWCA.
b. Process for communicating any commitments regarding ESA and FWCA
c. Procedures for complying with any commitments including mitigation.

- **Traffic Noise**

The DB Contractor shall address and document traffic noise mitigation. TxDOT has provided approvals and proposed permanent noise mitigation measures based on the approved Concept Plans and Preliminary ROW based on the approved FEIS(s), Re-evaluation(s), and ROD(s). If the DB Contractor proposes to make modifications to the approved Concept Plans and/or Preliminary ROW the DB Contractor will be responsible for supplementing TxDOT approved permanent noise mitigation. The documentation at a minimum shall include:

a. Process for carrying out noise mitigation measures as identified and discussed in the approved NEPA document and schematic, and any supplemental noise studies completed by the DB Contractor.
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 approved NEPA document and schematic.

To fulfill the commitments of the previously mentioned TxDOT-Provided Approvals the 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 the DB Contractor. The DB Contractor acknowledges that TxDOT-Provided Approvals and proposed permanent noise mitigation are based on the Concept Plans and Preliminary ROW; consequently the proposed permanent noise mitigation may require amending by the DB Contractor as the Work progresses. Such amendments shall be submitted to TxDOT for review and approval.

DB Contractor shall be responsible for any additional items that may be needed to complete a reevaluation (if necessary). DB Contractor shall be responsible to provide any items that may be needed to complete a noise workshop (if necessary). DB Contractor shall also be responsible for public notification and involvement per TxDOT *Guidelines for Analysis and Abatement of Highway Traffic Noise* and in accordance with Section 3 - Public Information and Communications of the Technical Provisions. DB Contractor shall allow 15 days for adjacent affected property owner comments after each noise workshop.

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 they will address wells (such as municipal, domestic, irrigation, oil and gas, or monitoring and observation wells) encountered during the life of the Project. The documentation shall include that the 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 the 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 the DB Contractor's work. Procedures shall include a requirement to notify TxDOT and with TxDOT's concurrence notify appropriate regulatory agencies 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 Agreement. TxDOT shall perform consultation for the Project according to current procedures for implementing Section 106 of the National Historic Preservation Act (NHPA), and the Antiquities Code of Texas.

DB Contractor shall be responsible for performing any necessary cultural resource surveys, evaluations, testing, and mitigation within the area of potential effect where proposed construction is outside the Project ROW shown on the Concept Plans and beyond the footprint of the original NEPA Approval. Such work shall be performed after issuance of NTP1 and prior to construction on the applicable areas.

DB Contractor shall be responsible for coordinating effects for non-archeological historical resources as project designs are finalized. TxDOT ENV will coordinate with the State Historic Preservation Office (SHPO) to make final determinations of eligibility and effects.

Antiquities Permits shall be obtained from the Texas Historical Commission (THC) for archeological surveys, testing, monitoring, and data recovery. The DB Contractor shall coordinate all necessary Antiquities Permits through TxDOT.

DB Contractor shall document efforts to avoid impacts to cultural resources that are listed on or determined to meet the eligibility criteria for listing on 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 as identified in the NEPA Approvals. These include the Big Ditch drainage ditch (Resource 039a) and the Main Canal (Resource 039b) of the Dayton Canal rice irrigation system; and the house and garage at 2669 FM 1485 (Resources 031a and 031b) in Harris County. See Appendix F of the FEIS for details on Resources.

In the event that unanticipated archeological deposits or evidence of other cultural resources are 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. The 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 the DB Contractor receives notification and approval from TxDOT.

- **Public Involvement**

DB Contractor shall document how they 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 include that the 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
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; and
d. Complying with jurisdictional waters and wetlands permits.

4.3.3 Environmental Protection Training Plan (EPTP)

The 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 designing, constructing, operating and maintaining a successful Project.
    - 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.
- Understand protocols for meeting environmental commitments for post-review discoveries.

c. Foster the DB Contractor's management and supervisory personnel's attitude of commitment to the Project's environmental quality.
d. Convey to all workers, the DB Contractor's management commitment to the Project's environmental quality.
e. Convey to all workers, TxDOT's and the DB Contractor's commitment to zero tolerance for violations.

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 the DB Contractor's environmental commitments and responsibilities at the Project level.
d. Worker responsibilities.
e. Waters of the US (including wetlands) identification.
f. Environmental Approvals terms and conditions including an overview of the provisions of the ESA, Migratory Bird Treaty Act (16 U.S.C. § 703, *et seq.*, as amended), and Stormwater Pollution Prevention Program (SW3P).
g. Terms and commitments as indicated in the USACE Individual 404 Permit(s), US Coast Guard Permits specifically for I-2, the TCEQ general construction permit and any other applicable local, state, and/or federal project specific permitting.
h. Ability to identify potential Threatened or Endangered Species as well as species of greatest conservation need as identified on the EPICs.
i. BMPs for environmental compliance, including pollution prevention, erosion, sedimentation, post construction controls, and dust control measures to maintain water and air quality.
j. Required mitigation measures.
k. Procedures and precautions in the event of spills of or discovery of Hazardous Materials or unknown chemicals or contamination.
l. Procedures and precautions in the event human skeletal remains or other archeological or paleontological resources are discovered.
m. Procedures regarding the relocation of historical markers (i.e. Texas Historic Commission Subject Markers, DAR OSR Markers, Texas Centennial Markers, Texas Highway Department Markers, and local/county markers).
n. Groundwater protection requirements.
o. CWA regulations and surface water protection requirements.
p. Overview of noise and residential impact reduction procedures.
q. Air quality requirements.
r. 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 Agreement. Course outlines shall be submitted within 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.

In addition to English, the workers must be provided the opportunity to receive their training and training materials in Spanish.

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 or Endangered Species) shall be used to update workers on specific restrictions, conditions, concerns, and/or requirements.

4.3.5 Hazardous Materials Management Plan (HMMP)

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 Site by the DB Contractor, encountered or brought onto the Site by a third party, or otherwise, during the Term of the Agreement. The DB Contractor shall submit the final HMMP to TxDOT for review and approval in its good faith discretion within 90 days of NTP1; approval of the HMMP 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, the DB Contractor shall keep and update Material Safety Data Sheets (MSDS), per OSHA requirements, for the Term of the Agreement.
b. Designated individuals responsible for implementation of the HMMP,
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 Investigation Report (SIR) in the event that Hazardous Materials are discovered during construction; operations or maintenance activities.
l. Identification and contact information for designated DB Contractor's responsible individuals.

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 DB Contractor, 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 Contractor 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.

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, field office site, plant sites, borrow site, or stockpile location, DB Contractor shall prepare an IWP 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 SIR 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 SIR 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 will, if found to be appropriate by TxDOT, and federal and State agencies, initiate a preventative or corrective action after TxDOT review and approval of the SIR from appropriate federal or State agencies.

4.3.6 Communication Plan (CP)

The 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 Contract 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. DB Contractor shall make available all Environmental Monitoring Reports for review by TxDOT at TxDOT's request. If any non-compliance or violation 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 of ten (10) Business Days advance notice to TxDOT of this joint inspection. The 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. 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 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”x17”. All photographs must be 4”x6”.

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

Within 90 days following Substantial Completion, DB Contractor shall conduct an inspection to monitor and repair any of the above mentioned deficiencies in the storm water system. DB Contractor shall complete all repairs as a condition of Final Acceptance.

4.3.8 Recycling Plan (RP)

The recycling plan shall document and fully detail the DB Contractor’s commitment to recycling, waste minimization and use of “green products” during all aspects of Work. The recycling plan shall document the 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, the DB Contractor shall follow the TxDOT Material Specification DMS 11000.

4.4 Environmental Team (ET)

DB Contractor, acting through the Environmental Compliance Manager (ECM), shall designate an ET, as detailed in this section, to prevent, minimize, and/or correct any violation of or noncompliance with Environmental Approvals. The ET shall include Environmental Training Staff, Environmental Compliance Inspectors (ECIs), Archeologist, Historian, Natural Resource Biologist, Water Quality Specialist, and Hazardous Materials Manager. All of the ET shall be deemed other principal personnel.

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

a. Staffing and availability of ECM and all ET personnel.
b. ET staff response times during the Work.

4.4.1 Environmental Compliance Manager (ECM)

DB Contractor shall designate a full-time ECM for the Work. The ECM shall report and coordinate all issues directly with TxDOT and the 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 the 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 the 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, the 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. If DB Contractor desires 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 ECM, DB Contractor's Hazardous Materials Manager shall act as an interim ECM.

The ECM shall have at least five years of experience successfully managing environmental compliance of sub-urban freeway construction. The ECM shall have the following experience:

a. Developing and managing a SW3P,
b. Developing and managing a hazardous substance and petroleum products management plan,
c. Implementing environmental mitigation plans,
d. Providing environmental and personal protection training, and
e. Monitoring compliance with Section 404/401 Permit conditions.

The ECM's qualifying experience must demonstrate the ECM is familiar with:

a. The scope and terminology of ASTM E 1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process,*
b. Provisions of the TPDES Construction General Permit (TXR 150000)
c. Requirements of Section 404/401 and permit provisions, and
d. FHWA and TxDOT guidance on NEPA and environmental compliance.

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 the DB Contractor's personnel. All training shall be in accordance with the requirements set forth in Section 4.3.3. Each Environmental Training Staff member shall have at least one year of experience providing environmental compliance inspection for sub-urban freeway construction.

4.4.3 Environmental Compliance Inspectors (ECI)

The ECIs shall conduct on-Site environmental monitoring, prepare documentation, and report to the ECM daily (at a minimum) compliance with Environmental Approvals.

The ECI 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.

Each ECI shall have at least one year operational control experience of SW3P activities.

4.4.4 Cultural Resource Management Personnel

The ECM shall designate an Archeologist and Historian to provide expertise in monitoring impacts to cultural resources during the course of the Work.

The Cultural Resource Management Personnel shall meet the certification requirements of TxDOT Precertification Work Category, 2.8.1, "Surveys, Research and Documentation of Historic Buildings, Structures, and Objects", 2.9.1, "Historic Architecture", 2.10.1, "Archeological Surveys, Documentation, Excavations, Testing Reports and Data Recovery Plans", and 2.11.1, "Historical and Archival Research", as applicable.

4.4.5 Natural Resource Biologist

The ECM shall designate a Natural Resource Biologist to provide expertise in monitoring impacts on wildlife and the natural environment during the course of the Work.

The Natural Resource Biologist shall meet the certification requirement of TxDOT Precertification Work Category 2.6.1, "Protected Species Determination (Habitat)" and 2.6.3, "Biological Surveys".

4.4.6 Water Quality Specialist

The ECM shall designate a Water Quality Specialist to provide expertise in permitting delineation, stormwater pollution prevention, and the protection of jurisdictional waters during the course of the Work.

The Water Quality Specialist shall have verifiable experience implementing SW3P and be able to demonstrate a working knowledge of the TPDES and MS4 permit requirements applicable to the Project.

The Water Quality Specialist shall meet the certification requirements of TxDOT Precertification Work Category 2.4.1, "Nationwide Permit" and 2.3.1, "Wetland Delineation".

4.4.7 Hazardous Materials Manager

The ECM shall designate 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 Agreement. The Hazardous Materials Manager shall conduct appropriate activities such as the following:

a. Schedule and/or conduct training for the DB Contractor's employees.
b. Verify all employee certifications prior to and required for any handling of Hazardous Materials.
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 40-hour HAZWOPER certification and at least five years' 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.
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 Precertification 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 Agreement. The 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 TxDOT, amend notifications as necessary, pay notification fees and abate asbestos found on any structure, including but not limited to bridges and buildings, in accordance with appropriate or relevant regulations or guidance. DB Contractor shall provide TxDOT any inspection reports; proposed abatement plan and/or report documenting abatement (as necessary).

4.8 Lead Based Paint

DB Contractor shall test, identify, inspect, notify, amend notifications as necessary, pay notification fees and abate for Lead Based Paint (LBP) on any structure, including but not limited to bridges and buildings, in accordance with appropriate or relevant regulations or guidance.

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, 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 attachments noted in this section and the Reference Information Documents.

For the purpose of the Agreement, DB Contractor will 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.

Third party agreements which DB Contractor shall assume and execute TxDOT's responsibilities and duties include, but are not limited to:

a. Attachment 5-1 – City of Dayton (Liberty County) Municipal Maintenance Agreement, (August 17, 1993)
b. Attachment 5-2 – City of Mont Belvieu (Chambers County) Municipal Maintenance Agreement, (October 5, 2001)
c. Attachment 5-3 – City of Baytown (Harris County) Municipal Maintenance Agreement, (April 15, 1968) including exhibits
d. Attachment 5-4 – Amendment to City of Baytown (Harris County)Municipal Maintenance Agreement, (November 13, 2012).
e. Attachment 5-5 – Amendment to City of Baytown (Harris County) Municipal Maintenance Agreement(April 24, 2013).
f. Attachment 5-6 – City of Patton Village Municipal Maintenance (Montgomery County) Agreement, (June 28, 1993).
g. Attachment 5-7 – Overpass Agreement Industry Track (Econorail) Agreement, Chambers County, Texas (August 1, 2003).
h. Attachment 5-8 – Underpass Agreement SH 146 Missouri Pacific Railroad (now Union Pacific Railroad) Spur Track to U.S. Steel Co. Plant Site East of Baytown, Texas, Control 389-12 (January 2, 1967).
i. Attachment 5-9 – Utility Agreement U1-4121, SH 99: From FM565 to FM 1405 (July 7, 2003).

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 for traffic signals, as described in the appropriate third party agreements in Section 5.1.

5.3 Roadway Illumination

Some local Governmental Entities may request continuous illumination along the frontage roads within the Project limits. If this occurs, 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. Design and construction of additional illumination by the DB Contractor will be treated as TxDOT-initiated change order.

For sections of continuous lighting specified by these additional agreements, safety lighting including 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.

5.4 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 an Affected Third Parties Plan, which describes how the DB Contractor will mitigate the impact of the Work upon potentially impacted third parties, for 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 (Agreements Between DB Contractor and Utility Owners).

The Project will be subject to 23 CFR Part 645 Subpart A, 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 Sections 6.8.1.1 and 6.8.6 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 the 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) of the Technical Provisions, 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 shall 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 facility crosses at no less than a 30 degree angle to the mainlane centerline and does not cross diagonally through connecting intersections. The existing Utilities 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. The affected Utility Owners shall agree and approve all proposed Utility Adjustment plans.

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, the Utility Owner and TxDOT) of all necessary Utility Agreements.

All Utility Agreements must be approved by TxDOT prior to any Utility Adjustment construction related 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 shall 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 (Standards), 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 facility, 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 and landscaping, whether the Utility Adjustment Work is performed by the Utility Owner or by DB Contractor.

6.1.2.6 *Early Adjustments*

At TxDOT's discretion, there may be early Utility Adjustment Work accomplished by TxDOT through a direct contract with the utility company to coordinate Utility Adjustment Work that would progress the Project. TxDOT will coordinate with and notify the Proposers of all early Utility Adjustment Work during the procurement and negotiation phases. If any Work is performed by TxDOT, an adjustment to the DB Contractor's Price may be required.

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 Acknowledgment or Utility Installation Request, Form 1082, as required in Section 6.2.4.5 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 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 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 the form (other than filling in the 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 form (other than filling in the blanks specific to a particular Utility Owner) in a Utility Owner-specific addendum.

Language modification to a UAAA shall 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 Contract 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 (including, but not limited to 43 TAC, Part 1, Chapter 21, Subchapter C, Utility Accommodation Rules), Regulations and Technical Provisions of the Agreement, including the Utility Adjustment Standards, 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 Contract Documents. DB Contractor shall notify TxDOT of all meetings and TxDOT 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 Affiliate, the DB Contractor may 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 UM 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 UM 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 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 Affiliate's 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 the 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 its Utility Adjustments. 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 the 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, 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 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 Acknowledgments 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 UJUAs using the TxDOT form included in Attachment 6-1. DB Contractor also shall prepare all required documentation to be included with each UJUA.

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 assembly package is submitted, a Utility strip map showing the information obtained and/or confirmed pursuant to this Section 6.3.1. DB Contractor's 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 facility (communication, gas, oil, water, etc.) size, material and the Utility Owner's name and contact information. The scale of the DB Contractor's Utility Strip Map shall be 1" = 100'. DB Contractor shall update the information provided in the RID Utility Strip Map with Subsurface Utility Engineering (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 Contract Documents, including Section 6.2.1 (Standards)
b) The Project design
c) Any existing and proposed Utility facility
d) All applicable Governmental Approvals
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 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 (DB Contractor's Responsibility for Utility Identification), 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 Plan(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 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, re-approval by the Utility Owner and re-submittal 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 (Standards). 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, review by DB Contractor and re-submittal 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 of these provisions for certain design requirements for underground Utilities within the potential freight 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 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 Acknowledgment (UJUA) 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 this Section 6.3.4.5.

Abbreviated Utility Assemblies. DB Contractor shall prepare an Abbreviated Utility Assembly for each Utility proposed to remain in 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 (When Utility Adjustment is Required). 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

6.4.1.1 *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 (Technical Criteria and Performance Standards);
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 (Utility Adjustment Field Modifications);
c) All Project safety and environmental requirements;
d) All pre-construction meeting requirements;
e) The ROW acquisition schedule described in Section 7 (ROW); and
f) Utility(ies) standards provided in the Utility Agreement.

6.4.1.2 *Reinstatement of Utility Cuts*

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

6.4.2 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 (General Construction Criteria). DB Contractor is responsible for quality control and quality assurance for all Work performed by the Utility Owners and/or their contractors.

6.4.3 Scheduling Utility Adjustment Work

The Utility Adjustment Work (other than construction) may begin at any time following issuance of NTP1. Refer to Section 4.4.2 of the Agreement for the conditions to commence construction of Utility Adjustment Construction 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 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 Contract 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 Contract Documents have been satisfied.

6.4.4 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.

6.4.5 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 the Utility Owner's Utility facilities.

6.4.6 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 UAFM proposed by DB Contractor, or DB Contractor's review and approval of a UAFM proposed by the Utility Owner. The UAFM shall have 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 anyUAFM to the appropriate construction field personnel; and
c) Inclusion of any UAFM in the Record Drawings for the Project.

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

6.4.7 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.

6.4.8 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 (Project Management). 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 Contract Documents.

DB Contractor shall provide, within 90 days after final Utility Adjustment is complete, a plan view of all final Utility facility 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 facility horizontal alignment with highway stationing, ROW lines, roadway features, Utility Owners name, Utility facility 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.

6.4.9 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 facility must be agreed to by TxDOT and the Utility Owner.

6.4.10 Traffic Control

DB Contractor shall be responsible for the Traffic Management Plan. The Traffic Management Plan shall cover all traffic control made necessary 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 (Traffic Control).

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 3.1.2 of the Agreement. All deliverables shall conform to the standards required in the Project Management Plan. Any deliverable submitted by DB Contractor to TxDOT Right of Way office for review after 11:59 a.m. will be considered as submitted on the next Business Day.

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) Three (3) Utility Assemblies (excluding Abbreviated Utility Assemblies); and
b) Three (3) 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 (UTR) 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, the Utility Owner, and 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 right of way 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/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 (UTR) 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:

   (i) Verify that each subject Utility (or the Utility Owner) is on the approved Alternate Procedure List, if applicable;
   (ii) Submit the complete Utility Assembly to the quality control/quality assurance entity designated by DB Contractor in accordance with the PMP; and
   (iii) 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 re-submittal 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 and of any other components of the Utility Assembly for which this Section 6 requires TxDOT 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 shall contain the following:

1. The Utility Agreement form (PUAA, UAAA, et al);
2. "As-built" plans;
3. UJUA or Form 1082;
4. Quitclaim form (D-15-30); and
5. 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 shall 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 Alternate Procedure List is impacted by the Project, DB Contractor shall submit to TxDOT all documentation as referenced above in order to update the Alternate 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.

DB Contractor shall provide TxDOT copies of all property agreements it obtains to facilitate design, construction or maintenance in relation to the Project. No conveyance documents shall be used for the purpose of Construction Work other than a deed, award, and Possession and Use Agreement (PUA) unless otherwise approved by TxDOT.

7.2 Administrative Requirements

7.2.1 Standards

DB Contractor shall acquire all Project ROW in accordance with State and Federal Laws and the practices, guidelines, procedures, and methods contained in the following as they pertain to Right of Way:

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 1,000 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 ROW Appraisal and Review Manual*, and a current approved Project ROW map for public use. DB Contractor's complete set of ROW Manuals shall be current at the time of contract execution. 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, and 23 CFR 710 governing the use of Federal funds for acquisition, management and disposal of real property.

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 a 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 Contract 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, at 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); and
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 (ROW Personnel Qualifications).

The ROW Acquisition Plan shall establish the specific means by which DB Contractor will:

1. 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.
2. Provide administrative support.
3. Provide for language, visually impaired, or hearing impaired translation, as necessary.
4. Provide documentation and reports.
5. Produce and distribute acquisition and relocation brochures as approved by TxDOT.
6. Establish, implement, and maintain quality control procedures and quality review standards for the acquisition for Project ROW.
7. Prevent fraud, waste, and mismanagement.

DB Contractor shall update the ROW Acquisition Plan regularly, at least quarterly, in accordance with the Contract 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 2.1.1.3 (Schedule Updates) 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, Condemnation Packages, payment Submittals, relocation

Submittals, administrative settlement Submittals, and closing Submittals. TxDOT intends to review the completed Submittals listed in this Section 7.2.4 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), as well as payment Submittals, relocation Submittals, administrative settlement Submittals, and closing Submittals up to a maximum of thirty-five (35). Any Submittals that will require TxDOT to review more than thirty-five (35) Submittals listed in this Section 7.2.4, within any given ten (10) Business Day period, shall be considered excess, and TxDOT may defer its review of any such Submittals listed in this Section 7.2.4 to a subsequent ten (10) Business Day period (or periods as necessary). TxDOT will notify DB Contractor of its election to defer any excess Submittals listed in this Section 7.2.4 within ten (10) Business Days after receipt. The balance of Submittals listed in this Section 7.2.4 in excess of thirty-five (35) will be rolled over to the next ten (10) Business Day period and added to the Submittals made by DB Contractor in that period. When DB Contractor submits more than thirty-five (35) Submittals listed in this Section 7.2.4 at any given time, DB Contractor shall indicate the priority of review. Any deliverable submitted by DB Contractor to TxDOT Right of Way office for review after 11:59 a.m. will be considered as submitted on the next Business Day.

If TxDOT notifies DB Contractor that any Submittal listed in this Section 7.2.4 has a deficiency, DB Contractor shall correct such deficiency and resubmit the package to TxDOT. Resubmissions shall be treated as a new Submittal as described above. A Submittal listed in this Section 7.2.4 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 a Submittal listed in this Section 7.2.4 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 Submittals listed in this Section 7.2.4 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 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 (a) approve and return the Project ROW acquisition documentation, (b) provide review comments for incorporation by DB Contractor in accordance with Section 7.2.4 (Schedule and Review Procedures), or (c) 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 the NEPA Approval is issued, 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 acceptable to TxDOT, DB Contractor will recommend for TxDOT to commence acquisition of the property through eminent domain procedures. TxDOT will initiate eminent domain procedures at its sole discretion. DB Contractor shall not recommend any condemnation action through the statutory "Declaration of Taking" procedure. TxDOT will not acquire any property through the condemnation process via the "Declaration of Taking" procedure.

DB Contractor or their Subcontractors shall not begin construction of any type 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), and all requirements under the Uniform Act have been met (including relocation assistance in accordance with Section 7.4.2).

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 and Utility 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; and
q) Obtaining rights of entry, as necessary

7.2.7 ROW Personnel Qualifications

DB Contractor's ROW Acquisition Manager (ROW AM) – Each ROW AM shall have at least seven (7) years' 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.

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 Montgomery, Harris, Liberty and Chambers Counties, and 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 or 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 Montgomery, Harris, Liberty and Chambers 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 as either a real estate sales agent or real estate 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 SPD 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 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 (a) 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; (b) 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 (c) 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:

1. 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 Contract Documents, the FHWA, and/or TxDOT.

2. 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.
3. Maintain and electronically transmit to TxDOT, in a format acceptable to TxDOT, monthly status reports including appraisal, acquisition, eminent domain 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 and other property interests, and provide weekly (or as requested) updates to TxDOT.
4. Evaluate and report to TxDOT, Subcontractor status and performance on a monthly basis or more frequently as requested.
5. 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.
6. 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 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, and without the necessity of further documentation executed by the State, obtain the rights to said saleable improvements. TxDOT has received the benefit of the saleable value of the improvements by a reduced DB Contractor price. 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, 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) Original conveyance document(s) (PUA(s), deed(s), easement(s), judgment(s), Award of Commissioners);
c) Original 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:

1. Relocation files (in chronological order);
2. Offer Letters;
3. Negotiator Reports and/or Contact Sheets;
4. General correspondence; and
5. 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 Contract Documents, by the State, or by applicable Law subject to submission requirements and timelines in Section 7.2.4 (Schedule and Review Procedures).
b) After receiving a complete Condemnation Package from DB Contractor in accordance with Section 7.2.4 (Schedule and Review Procedures) and Section 7.4.4 (Condemnation Support), 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 7.2.4 (Schedule and Review Procedures) and Section 7.4.6 (Payment Submittal), 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 five (5) 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 packet, including Commission minute order

approval. TxDOT will deliver the e-filed condemnation petition to DB Contractor within ten (10) Business Days after receipt of the condemnation petition from the Office of the Attorney General. If e-filing is not applicable, DB Contractor shall follow the standard procedures as described in the TxDOT *Right of Way Manual*.

e) If applicable, TxDOT will provide all e-filed documents to DB Contractor as part of DB Contractor's support of the condemnation process and invoice DB Contractor for all e-filed charges. DB Contractor is responsible for reimbursing TxDOT all e-filed invoices. If e-filing is not applicable, DB Contractor shall follow the standard procedures as described in the TxDOT *Right of Way Manual*.
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; and
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 Package. The Acquisition Survey Document shall include:

a) Three (3) half size right of way 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 tract deeds and subdivision plat if tract is a platted lot.
c) A CD with a Microstation (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 right of way map on paper, Scale 1" = 50' (22" X 34").
e) One (1) set of folders for each parcel, Parts 1 & 2, etc., would be considered one folder. With one (1) 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 RPLS to be kept in mapping files.

DB Contractor shall prepare all Project ROW surveying and mapping in accordance with the following supplemental specifications:

1. 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 (3) items for each of the parcels to be acquired. The latter three (3) items shall be on standard 8 ½" 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 shall show identical "as of" dates.

2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. Any existing ROW lines being incorporated into the proposed Project ROW, including intersecting ROW, shall be surveyed and monumented (if not previously monumented).
9. 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 (Design Requirements)).
10. 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.
11. All Project ROW maps shall include a control sheet(s), to show the primary survey control points with their location relative to the Project.
12. 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”.
13. Improvements within 100 feet outside of all proposed Project ROW shall be depicted on the Project ROW map sheets. All improvements shall be current as of the date of the on-the-ground property survey.
14. 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.
15. Calculated points shall be shown by a symbol on the drawing, with their relationship to the found reference points.
16. All property, city, county, abstract, section and survey lines shall be indicated appropriately. A map legend shall clearly define the line styles and symbols used.
17. 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).

18. 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.
19. 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.
20. 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.
21. Documents shall contain deed references (survey name, abstract number, volume and page or document number, grantee, and area) for all existing public right of way 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 right of way as shown hereon”.
22. 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.
23. 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.
24. 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 (1) 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.
25. 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.

26. DB Contractor shall cause an independent Registered Professional Land Surveyor (RPLS) to review the Acquisition Survey Document 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 as complete until the reviewing RPLS has signed and sealed the compliance certificate (compliance certificate form to be provided by TxDOT).
27. Parcel numbering shall follow the TxDOT *Right of Way 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 parent tract is sold which will also require Project ROW acquisition. The result is Parcel 14 is "Not Used", and the two (2) 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.
28. 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) shall 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.
29. 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.
30. At property corners where more than one (1) monument is found, a detail shall be provided to show the measured relationship between the monuments found and the monument set or held.
31. 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.
32. 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 (Standards), including the following requirements:

a) Select and contract with one (1) or more title companies approved by TxDOT and deliver to TxDOT a five (5) 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 Contract 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 shall be removed, including easements that (a) are appurtenant to and/or of benefit to the parcel but are 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 the 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 Manager 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.texasattorneygeneral.gov/files/agency/landowners_billofrights.pdf.

7.3.5 Appraisals

7.3.5.1 *Appraisal Services*

DB Contractor shall provide TxDOT with 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 pre-certified 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. Attachment 7-1 – Right of Entry Agreement contains an approved "Right of Entry Agreement" template to be utilized. DB Contractor may, at its 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 USPAP 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 SPD 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 SPD 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) DB Contractor shall utilize the appropriate TxDOT forms in considering all outdoor advertising signs. The forms shall be completed and executed by the outdoor advertising sign owner.

For all parcels to be acquired that have off-premise outdoor advertising signs (sign structure), the preliminary appraisal package or the appraisal in the Acquisition Package, submitted for TxDOT approval, must include:

(1) Completed and executed appropriate TxDOT forms; and

(2) If applicable, the value of fthe sign structure as a real property fixture in accordance with TxDOT policy.

i) 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 in accordance with the TxDOT *Right of Way Manual* and USPAP. DB Contractor shall also provide administrative and/or technical support for such proceedings as requested by TxDOT.

j) Coordinate with the review appraiser regarding corrections and/or additional information that may be required for a particular appraisal.

k) Cause a report to be prepared by an environmental professional that meets the qualifications set forth in ASTM E-1527-13, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process, documenting the environmental condition of each parcel, which may be used on field investigations and/or historical review, as appropriate for the particular parcel. As directed by TxDOT, DB Contractor shall submit a summary report of the Phase I site assessment. A template or sample of this summary report shall be provided by TxDOT in the Reference Information Documents (RIDs). Upon completion, the report shall be made 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 Environmental Site Assessment Phase II and/or III, DB Contractor may submit the Acquisition Package and Condemnation Package without the Environmental Site Assessment reports. However, DB Contractor will be responsible for performing and receiving approval from TxDOT

for all required Environmental Site Assessments after possession of the property has been obtained through condemnation before commencement of construction.

l) Engage the services of, and cause, a land planner to perform, or otherwise assist in the preparation of, any and all appraisals. The land planner shall be involved with all parcels with a valuation analysis indicating a highest and best use that is other than the current use of such parcels, 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.

m) 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 and Advisory Opinion, AO-3. At a minimum, the updated appraisal report or new assignment must include:

(i) 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.

(ii) An updated Page 1 from TxDOT Form SPD ROW-A-5 – Real Estate Appraisal Report 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.

(iii) Any qualifying and limiting conditions or general assumptions by the appraiser shall be clearly stated and attached.

(iv) 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 the TxDOT Form SPD ROW-A-5 – Real Estate Appraisal Report. Appraisers shall refer to the TxDOT *ROW Appraisal and Review Manual* for additional guidance. DB Contractor shall follow these guidelines in producing updated appraisal reports or new assignments and shall discuss specific updating requirements for any complex appraisals with TxDOT before beginning the assignment.

n) Prepare and deliver to TxDOT upon request, a copy of all file documents, as formally requested in discovery motions or request for production.

o) Complete with the property owner and furnish, to the appraiser and Relocation Agent, TxDOT Form SPD 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 pre-certified fee appraisers meeting the requirements of Section 7.2.7 (ROW Personnel Qualifications). The review appraiser selected must follow the appraisal guidelines and procedures found in the TxDOT *ROW Appraisal and 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 and Review Manual*, the *Uniform Appraisal Standards of 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 review appraiser shall certify in writing to TxDOT that all required standards have been met. This certification will occur by signing on Page 1 of the TxDOT Form SPD ROW-A-5 - Real Estate Appraisal Report, in the block provided. The review appraiser will also complete TxDOT Form SPD ROW-A-10 - Tabulation of Values, to accompany each appraisal.

f) For appraisal updates or new assignments, the review appraiser shall perform a complete review of the updated or new 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 SPD ROW-A-10 - Tabulation of Values, will be required for each updated appraisal or new assignment.

g) In accordance with providing a Quality Control Specialist(s) as stated in Section 7.2.7 (ROW Personnel Qualifications), DB Contractor shall 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:
   - (i) Parcel number and number of parts
   - (ii) Station number
   - (iii) CSJ number
   - (iv) Federal Identification Number (if applicable)
   - (v) Location of parcel
   - (vi) Name of owner
   - (vii) County and/or other jurisdiction
   - (viii) Extent of acquisition (partial or whole acquisition)
   - (ix) 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.

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 SPD 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 (10) 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 six (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 and the State of Texas Landowner's Bill of Rights as updated on the Office of the Attorney General's website:

   https://www.texasattorneygeneral.gov/files/agency/landowners_billofrights.pdf.

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 (Administrative Requirements). 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 contact 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 other appointed representative(s) supported by a written confirmation of appointment) who has a compensable interest in each parcel on TxDOT Form SPD 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 (Administrative Requirements). 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 packet to TxDOT for approval within six (6) months from the date of the PUA. No other conveyance documents shall be used for the purpose of Construction Work unless otherwise approved by TxDOT.

m) Consider 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 through Friday: 8:00 a.m. to 5:00 p.m.
b) Saturday: 9:00 a.m. to 12:00 p.m.
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:

1. Prepare a Relocation Plan in accordance with the TxDOT *Right of Way Manual*, Volume 3, Chapter 8 (Relocation Program Planning and Construction) within 90 Days after receipt of NTP1, as stated in the Project Management Plan requirements.
2. Monitor relocation assistance activities and provide advisory services.
3. Prevent fraud, waste and mismanagement.

4. 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 SPD ROW-R116 - Replacement Housing Inspection).
H. Obtain at least two (2) 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 Act.
K. Maintain relocation contact logs on a TxDOT Form SPD 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 simultaneously 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, in writing, when displacee has vacated or abandoned the affected dwelling or structure. In addition, insure all personal property from the Project ROW is removed.
Q. Notify TxDOT's ROW Manager office immediately, in writing, if a displacee has not moved after 30 Day notice expires. Special effort and consideration shall 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, 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.
R. Be available for any appeals or hearings.

S. Prepare relocation payment claim submissions for all displacees and all relocation assistance benefits.
T. Verify DSS dwelling criteria on all replacement housing as selected by the displacees.
U. Secure dwellings and structures no later than ten (10) days after vacancy and protect the Project ROW following acquisition and relocation. It is the DB Contractor's responsibility to insure that all occupied and vacated improvements maintain insurance coverage or assume liability through completion of demolition.
V. Maintain a complete file, separate from acquisition files, on each displacee and make available for inspection.
W. 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.
X. 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.
Y. Deliver to each displacee the relocation assistance payments according to the TxDOT *Right of Way Manual, Volume 3 - Relocation Assistance – Chapter 4 Program Administration – Section 1 Procedures – Delivery of Payment*.
Z. 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: i) a reference to the disposition of any environmental matters; ii) updated title commitment, no more than 15 Days prior, with notations indicating the disposition of all schedule "B" and "C" items; iii) a copy of the executed warranty deed to be delivered; iv) a proposed closing statement indicating disposition of all proceeds; e) a copy of any and all releases of liens; v) a copy of any miscellaneous documents and other curative matters required to be delivered at closing and vi) a copy of the closing memorandum outlined in item b) 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 and transmit to TxDOT a copy of the issued title insurance policy and recorded conveyance document based on the approved updated title commitment within 45 Days following closing.

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 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 of the 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 (10) 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 the applicable TxDOT form. Spouses of property holders with compensable rights must also be joined.
f) Upon completion of TxDOT Form SPD ROW-E-49 - Request for Eminent Domain Proceedings, prepare a condemnation packet containing two (2) 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 the 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 (1) copy of all the appraisal reports and evidence of a bona fide offer to the property owner. Submit two (2) complete Condemnation Packages to TxDOT's ROW Manager 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. DB Contractor shall provide a copy to TxDOT.
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 Office of the Attorney General 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 (6) months have elapsed since the date of the initial offer, contact TxDOT and TxDOT will contact the Assistant Attorney General handling the case for TxDOT and confer about the advisability of preparing an updated appraisal or new assignment. 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 Office of the Attorney General as to land planners and/or other expert witnesses as required by the Office of the Attorney General. DB Contractor, at its cost, shall provide the land planner or other expert at the request of TxDOT or the Office of 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 Office of the Attorney General. The appearances may include pre-commissioner's hearing preparations, Special Commissioner's hearings, subsequent proceedings including jury trials and related proceedings and as other needs arise.

n) Submit the updated appraisal or new assignment to TxDOT for review and approval. Once approved, TxDOT shall transmit the approved appraisal to the Office of the Attorney General. TxDOT 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 reminder letters 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 SPD 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 and through any maintenance agreement periods. The selection of all expert witnesses to be used for jury trials shall be determined by the Office of the Attorney General.

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 Office of the Attorney General 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 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. If legal proceedings are initiated, all photos of personal property and any other items of dispute shall be 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 and provide copies of such Governmental Approvals to TxDOT.
e) To the extent required by Section 7.2.11 (Responsibilities of DB Contractor), 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 real or abandoned personal improvements.
j) Notify TxDOT upon completion of the demolition and clearance of the Project ROW, as applicable.

7.4.6 Payment Submittal

DB Contractor must submit a payment Submittal for any item that is a TxDOT payment responsibility as outlined in this 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 (ROW AM).

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 for Construction of Highways, Streets and Bridges*. Fencing standards for DB Contractor-provided fencing shall conform to the overall aesthetics requirements found elsewhere in these Contract 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 (1) 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 the following clause in the memorandum of agreement or the purchase agreement for such property:

"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 NTP2. DB Contractor will be updated regularly on the status of the acquisition process for each parcel, if any.

After issuance of 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 both thorough and complete in accordance with TxDOT's *Geotechnical Manual*, AASHTO and FHWA geotechnical requirements, so as to provide accurate information for the design of roadways, pavements, foundations, structures, embankments, excavations, slopes and other facilities that result in a Project that is in accordance with TxDOT, AASHTO and FHWA geotechnical requirements, and meets the Agreement requirements.

The DB Contractor is responsible for all analyses, designs, detailing, clearances, and tolerances of components to ensure that components meet all form, fit, and functional requirements necessary for satisfactory operation of the indicated Elements of the Project in accordance with the current TxDOT *Geotechnical Manual* and *Houston District Guidelines for Foundation Design* in Attachment 8-1.

8.2 Design Requirements

8.2.1 Subsurface Geotechnical Investigation by DB Contractor

The subsurface investigation shall include but not be limited to 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 that the DB Contractor considers necessary to provide a safe and reliable roadway, pavement, foundation, structure, embankment, excavation, slope and facilities and other facilities for the Project.

The DB Contractor shall employ field investigation measures that avoid groundwater contamination and shall be responsible for all mitigation and/or restoration associated with the geotechnical investigations.

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 types, 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, in-situ test results, and recovery and Rock Quality Designation (RQD) for rock cores. Results of laboratory testing shall include 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, compaction characteristics (Proctor tests), resilient modulus tests, short-term and long-term strength tests and properties in accordance with TxDOT and ASTM geotechnical testing standards. Other field exploration and laboratory testing shall be performed as appropriate.
c. A discussion of conditions and results with reference to specific locations on the Project
d. Design and construction parameters resulting from the geotechnical investigation and analysis, including parameters for the design of pavements, pipes, foundations, structures, slopes, retaining walls, sound walls and embankments.
e. Slope stability analyses for embankment and excavation, including roadway section, 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 retaining 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, when required, are intended to predict the post-construction settlements at the finished ground surface. These analyses shall consider both total and differential settlements. Quantitative settlement analyses shall consider the compressibility of the proposed fill and the underlying soil and rock and their potential for settlement due to the weight of the fill and the weight of proposed structures. These evaluations shall consider but not be limited to primary consolidation, secondary compression, hydro-compression, and expansion. Settlement analyses shall be performed for all approach embankments to grade separation and other bridge structures. Where necessary, embankment foundations shall be treated to provide a maximum differential settlement of 1" between the approach embankment and the bridge.
g. Plan view locations of field sampling (boring locations plan), boring logs and other field data, laboratory test results, calculations, and analyses that support design decisions.

The report shall:

a. Document that adequate investigation, testing, analysis, design, mitigating measures and construction planning are applied to assess and provide for the effects of swell pressures from expansive soil and rock materials on foundations, pipes, pavements and earth retaining structures. They shall address all design features and facility characteristics that could affect expansive soil behavior.
b. Provide design and construction parameters derived from geotechnical investigations for the design of structure foundations, pipes, pavements, slopes, embankments, detention ponds 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 surface and subsurface facilities.

Each Geotechnical Engineering Report, upon completion and including any later supplements or amendments shall be submitted to TxDOT for review and comment.

8.2.2 Pavement Design

The TxDOT *Pavement Design Guide* (latest version) shall be the basis for all pavement designs for the Project, and is supplemented with the requirements contained within these Technical Provisions 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.

The number of ESALs and/or the traffic volumes to be used in the pavement designs shall be those provided in Attachment 8-2 – ESALs and Traffic Data. The information provided shall be deemed a minimum acceptable traffic volume and composition to be used by DB Contractor for the purpose of pavement design reports. TxDOT does not warrant the accuracy or completeness of the corridor traffic data, extrapolations, or interpretations of current or future traffic or composition of traffic.

Lane distribution factors for both flexible and rigid pavement designs shall be applied in accordance with the following criteria:

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

For the mainlanes, the lane distribution factor shall be based on the number of through lanes, excluding auxiliary lanes.

DB Contractor should expect that subgrade materials will vary throughout the Project limits. DB Contractor shall verify that the materials encountered or imported meet the Effective Modulus of Subgrade Reaction, Effective Resilient Modulus or other design subgrade support value as utilized for the structural layers for pavement design. 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.

DB Contractor shall prepare separate pavement designs, as applicable, for the following:

a) Mainlane and ramp pavements
b) Mainlane and ramp Toll Zones as described in Section 21 – Tolling
c) Frontage road pavements
d) Cross-road pavements
e) Service driveways and parking areas
f) Temporary pavement construction areas

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 materials, general specifications, and thicknesses
b. Life-cycle cost analysis as required by the TxDOT *Pavement Design Guide*, including the periods for resurfacing, reconstruction, and other rehabilitation measures and what these activities are likely to entail
c. Relevant 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. Design criteria used in determining 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

DB Contractor shall submit the following to TxDOT for review:

a. Pavement Design Reports and any subsequent 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. Traffic control plans associated with subsurface geotechnical or pavement investigations
d. A list of all geotechnical and pavement design software proposed for use
e. Verification plan for effective modulus of subgrade reaction (rigid pavement) and/or effective resilient modulus (flexible pavement)

8.2.2.1 *Related Pavement Materials Specifications*

Unless otherwise specified herein, pavement material requirements are defined in the TxDOT Standard Specifications and per special provisions, if applicable, as provided in these Contract 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.

8.2.2.2 *Pavement Type Selection*

The following requirements shall be incorporated into the final pavement selection and design:

Mainlane Pavement. Continuously Reinforced Concrete Pavement (CRCP) with a thirty(30)-year design life shall be used for the mainline pavement.

Shoulders. Pavement for the shoulders of all roadways shall be the same section (materials and depths) as the adjacent roadway pavement.

Toll Zone. Toll Zone(s) lanes shall be CRCP as shown in Attachment 21-3 – Toll Zone Pavement Details.

Ramp Pavement. Ramp pavements shall be constructed with the same materials and depths as the adjacent mainlane pavement up to the mainlane gore. The remainder may match the frontage road pavement.

Frontage Road Pavement. Frontage Road pavements shall be constructed using rigid pavement (CRCP) with a minimum thickness of 8”.

Heavy Haul Route. Eastbound Frontage Road in Segment I-2B between Cedar Bayou and FM 1405 shall be constructed using rigid pavement (CRCP) with a thickness of 12”. Base and sub-base section shall be 1” Bond Breaker on 6” Portland Cement Treated base and 6” lime treated subbase.

Cross Road Pavement. Cross Road pavements shall be constructed with the same section (materials and depths) as the frontage road.

8.2.2.3 *Rigid Pavement*

Design Specification. Rigid pavement shall be designed in accordance with the TxDOT’s *Pavement Design Guide* using the design inputs as summarized in the table below.

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	600 psi/inch maximum
Serviceability Indices ▪ Initial Serviceability Index ▪ Terminal Serviceability Index	 4.5 2.5
Load Transfer Coefficient	*
Drainage Coefficient	**
Overall Standard Deviation	0.39
Reliability %	95
18 Kip Equivalent Single Axle Load (ESAL) and Traffic Data	Attachment 8-2
* 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 shall be the value to be achieved at all times during construction activities.

Continuously Reinforced Concrete Pavement (CRCP). The TxDOT and Houston District Standards shall be utilized. Including, but not limited to:

CRCP(1)-11 13 "Continuously Reinforced Concrete Pavement, One Layer Steel Bar Placement".

The TxDOT Standards shall be supplemented with Houston Standards including, but not limited to:

CRCP-HS "Continuously Reinforced Concrete Pavement Houston Supplement"

8.2.2.4 *Flexible Pavement*

Design Methodology. For flexible pavement design, the DB Contractor shall use the online TxDOT *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 DARWin 3.1 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.

Performance Life Requirements. A design life of 30 years shall be used with an initial performance period of at least 15 years.

Design Modulus. 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 either the FPS-21 or AASHTO design procedures, 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 (MR) testing is only applicable to subgrade materials; that is, natural subgrade or materials imported as embankment and are not stabilized. The DB Contractor shall 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, DB Contractor shall determine MR 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.

DB Contractor shall 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.

DB Contractor shall distribute MR values as shown in Table 8-3 for the region in which the DB Contractor will be constructing the project. DB Contractor shall determine which distribution to apply by selecting the rainfall range appropriate for the Project location from Figure 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) 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, whichever is greater. Refer to Table 8-4 for asphalt stabilized base moduli.

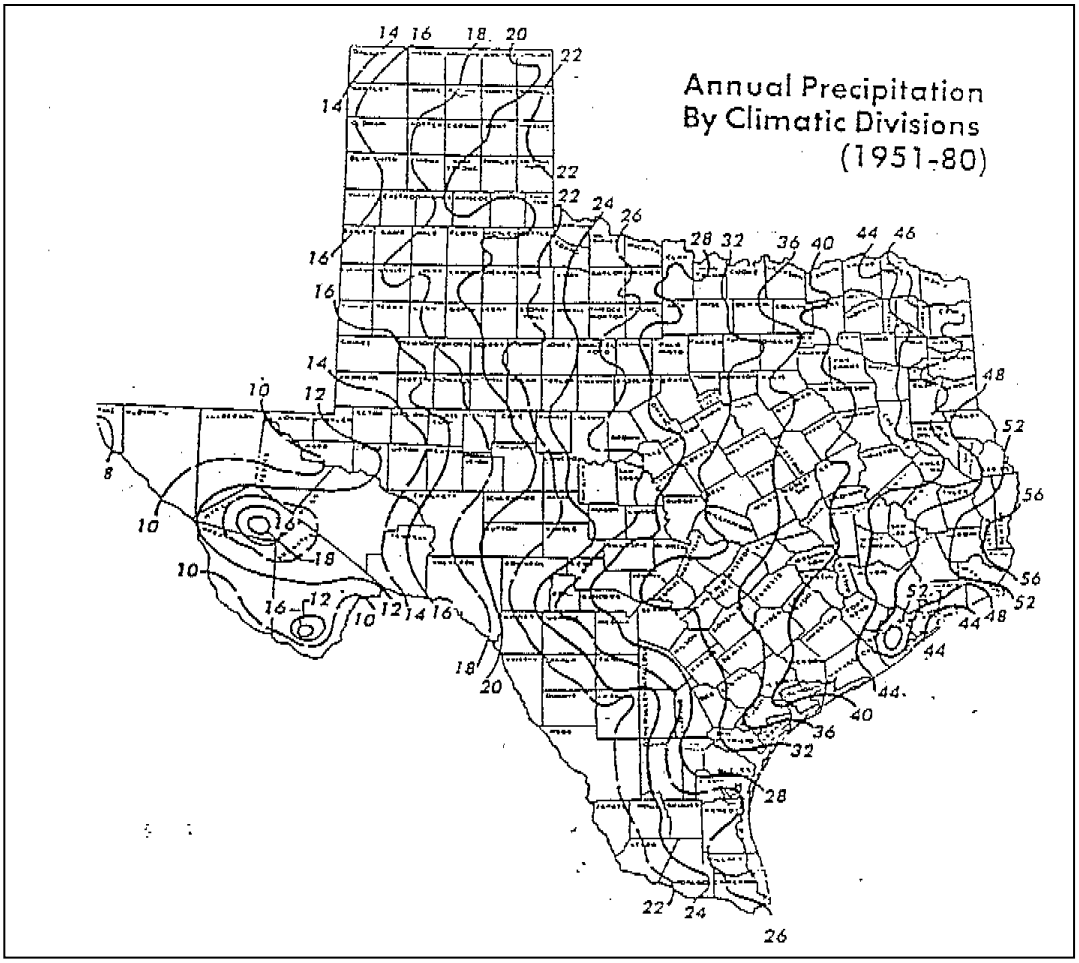

Figure 1. Rainfall graph for determining regional soil testing requirements

(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 subgrade.

(e) ***Design Structural Values.*** DB Contractor shall use Table 8-4 for structural material design values. For materials not listed, provide documented testing establishing the design value appropriate for the design procedure being used.

Table 8-4. Design Structural Values

Material Type	2004 Specification	Maximum Modulus for FPS-21	AASHTO layer coefficient (max.)
Dense-Graded Hot Mix Asphalt (HMA)	Item 340, 341	Combined HMA thickness: ≤8" use 500ksi > 8.0" use 650ksi	 0.44 0.45
Permeable Friction Course	Item 342	300 ksi	0.30

Performance Design Mixtures	Item 344	Combined HMA thickness: ≤ 6.0" use 650ksi 6"<T≤8" use 700ksi > 8.0" use 850ksi Rich Bottom Layer(RBL): 350ksi	 0.45 0.46 0.47 RBL: 0.40
Stone-Matrix Asphalt	Item 346	Same as Item 344	Same as Item 344
Stabilized Base ▪ Cement ▪ Asphalt	 Items 275 and 276 Item 292	 *150ksi 400ksi	 0.16 0.34
Stabilized Subgrade or Sub-base ▪ Hydrated Lime ▪ Cement	 Item 260 Item 275	 *30ksi *30ksi	 0.12 0.12

* Maximum design values.

Poisson's Ratio. DB Contractor shall use 0.20 for cement stabilized or fly ash stabilized materials meeting the requirements of Items 275, 276 and 265 as defined in the most recent edition of the TxDOT Standard Specifications. DB Contractor shall use 0.35 for all other materials not identified in the aforementioned Items; except for subgrade or embankment/fill materials, use 0.4.

Truck Volumes. The percentage of truck traffic as well as the annual growth percentage in truck volumes shall be those which are provided in Attachment 8-2 – ESALs and Traffic Data.

Initial ADT and 30-year projected ADT. The Initial ADT is the projected ADT when the Project is opened for public access as provided in Attachment 8-2 – ESALs and Traffic Data. The ADT projected to occur 30 years after the Project is opened to public access is provided in Attachment 8-2 – ESALs and Traffic Data.

Initial Serviceability Index. The initial serviceability index for frontage roads on this Project shall be 4.5 and for mainlanes shall be 4.8.

Serviceability Index (SI) after Overlay. The SI after overlay shall be 4.0.

Terminal (Minimum Acceptable) Serviceability Index. The terminal serviceability index at the end of any performance period for this Project shall be 2.5 for mainlanes and 2.0 for frontage roads.

Serviceability Index After a Structural Overlay (FPS design only). Where no level up course of HMA is placed prior to a single lift HMA overlay, use 4.0. Where a level up used or multiple HMA lifts, use 4.2.

Design Reliability or Confidence Level. The reliability factor shall be 95%.

Maximum Period of Overlay. The maximum planning period for any overlay following the initial performance period of this Project shall not exceed fifteen (15) years. The minimum period shall be eight (8) years.

Overall Standard Deviation (AASHTO design only). Use 0.49.

8.3 Construction Requirements

8.3.1 Pavement Materials Requirements

DB Contractor shall incorporate the following requirements into the preparation of the 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 the 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, the 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 additives shall be added to soils that would cause a detrimental reaction to the pavement structure or its ride quality as measured by the International Roughness Index (IRI).

Stabilized Base. Stabilized base may either be modified with chemical additives or asphaltic binders. Liquid additives shall not be used. Cement-treated base shall meet the requirements of Item 276 of TxDOT Standard Specifications, except as shown below. Materials to be stabilized shall meet the requirements of either Grade 1, Grade 2, or Grade 3, and Type A (under flexible pavement) or Type D (under rigid pavement) 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. When chemical additives are used to stabilize base, Table 8-5 will be used to determine the stabilizer content. Stabilized base will be designed to achieve the unconfined compressive strength shown in Table 8-5 immediately following a ten (10) day capillary moisture conditioning. Moisture conditioning will be conducted in a similar method as that used in TEX-121-E.

Table 8-5. Minimum and maximum retained unconfined compressive strength 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

Asphalt Bond Breaker (ASB) shall be in accordance with Item 292 of the TxDOT Standard Specifications, Asphalt Stabilized Base (Grade 4) (Performance Graded [PG] binder 64), and shall meet the following additional requirements:

a. Meet the following grading requirements:

Sieve	Percent Passing
Size	**Grade 4 (Bondbreaker)**

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

b. For nominal aggregate size less than 0.5 in., design the mix in accordance with test method TEX 204-F. The minimum stability is 30 percent with a laboratory molded density of 96 percent plus or minus 1.5 percent.

c. If the layer thickness after placing is 1.25 in. or less, the bond breaker is exempt from the in-place density control described in Section 292.4.E, "Compaction."

Subbases.

a. Granular Materials. Materials classified by the Unified Soil Classification System as any of the following: GP, GM, SW, SP, SM, SC, 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 of the TxDOT *Standard Specifications*. Grade 1 or 2 may replace these materials without restriction.

b. Stabilized Subbase. Materials not included in granular materials above, that do not meet the requirements of Item 247 of TxDOT Standard Specifications, may be stabilized and used as a structural layer. For structural layers, provide a minimum 6-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 will 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.

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 6-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.

Underseal. The DB Contractor shall place a one (1) course surface treatment as an underseal directly on top of treated base layer and/or prior to all hot mix asphalt concrete overlays.

Surface Course. The surface course for all roadways utilizing flexible pavement design shall be a minimum of 2 inches of asphaltic concrete pavement.

Mix Selection. The final surface mix for frontage roads shall be stone matrix asphalt (SMA) meeting the requirements of Item 346 of TxDOT Standard Specifications, 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/SS 3224 when the combined HMA thickness used is less than 6.0 inches.

8.3.2 Construction Verification

General. The independent Construction Quality Assurance Firm (CQAF) shall perform the 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, the 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, the DB Contractor shall coordinate excavation activities with Section 5 and 6. For those occurrences involving TxDOT's structures and Utilities, the DB Contractor shall coordinate excavation activities with TxDOT.

Effective Modulus of Subgrade Reaction. 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. The DB Contractor shall submit this verification plan to TxDOT for review and comment.

Effective Resilient Modulus, (MR). DB Contractor shall provide subgrade modulus verification testing in accordance with AASHTO T307. 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 will be collected and tested. Frontage and other access roads are 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, 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 TxDOT.

Smoothness Specification. Smoothness of the pavement constructed shall conform to Item 585 of TxDOT Standard Specifications, Ride Quality for Pavement Surfaces, amended as cited below:

Article 585.3 Section 4. Acceptance Plan and Pay Adjustments. The entire section is voided and replaced by the following:

TxDOT will evaluate profiles based on the 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, or in excess of 65 inches per mile for flexible pavements. After making corrections, re-profile the pavement section to verify that corrections have produced the required improvements.

DB Contractor shall use diamond grinding or other methods approved by TxDOT to correct surface areas that have more than 1/8 inch variation between any two 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. For asphalt concrete pavements, fog seal the aggregate exposed from diamond grinding.

Article 585.4 Measurement and Payment. The entire section is voided.

9 LAND SURVEYING

9.1 General Requirements

DB Contractor shall provide accurate and consistent land surveying and mapping necessary to support ROW acquisition, 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 the *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 Project 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 coordinate with the Contractor of the adjoining project regarding planned construction activities. DB Contractor shall notify TxDOT within two 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 the U.S customary units system of measurement. Work shall conform to state plane coordinates. The surface adjustment factor for the Project is 1.0000437 from US 59 interchange to US 90 (Segment H) and 1.00013 from US 90 to end of project (Segment I-1 and Segment I-2).

$$\frac{\text{Surface Coordinates}}{\text{Adjustment Factor}} = \text{Grid Coordinates}$$

9.3.2 Survey Control Requirements

DB Contractor shall base all additional horizontal and vertical control on the Level 2 and Level 3 control provided by TxDOT.

DB Contractor shall establish and maintain additional survey control as needed and Project ROW monumentation throughout the duration of the Project. DB Contractor shall tie any additional horizontal and vertical control for the Project to the TxDOT-supplied Primary (Level 2) or Secondary (Level 3) 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 *GPS User's Manual* and shall utilize the primary survey control 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.

DB Contractor shall establish and maintain a permanent survey control network. The control network shall consist of, at a minimum, monuments set in intervisible pairs at spacing of no greater than three miles.

Monuments shall be TxDOT bronze survey markers installed in concrete and marked as directed by the TxDOT *Survey Manual*. DB Contractor shall replace all existing survey monuments and control points disturbed or destroyed. DB Contractor shall make all survey computations and observations necessary to establish the exact position of all other control points based on the primary control provided.

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 are available.

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. Project survey control data for Segments H, I-1 and I-2 is contained in Attachment 9-1 – Survey Controls.

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, South Central Zone, North American Datum of 1983 (NAD 83).

	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 anycourse in traverse
Adjusted Mathematical Closure of Survey (No Less Than)	1:200,000	1:200,000	

* TxDOT policy requires all bearings or angles 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), 1991 Adjustment.

	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 spirit standard, quality rod	When two or more level rods are used, they shall 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

DB Contractor shall base all surveys on the horizontal and vertical control network provided by TxDOT.

9.3.4.1 *Accuracy Standards*

In performing right of way surveys consisting of boundary locations, DB Contractor shall meet the accuracy standards of the appropriate level of survey as defined in the following table.

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 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. 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 or all field notebooks to TxDOT upon request.

9.4 Construction Requirements

9.4.1 Units

All survey Work shall be performed in the U.S customary units system of measurement. Work shall conform to state plane coordinates. The surface adjustment factor for the Project is described in Section 9.3.1.

9.4.2 Construction Surveys

DB Contractor shall perform all construction surveys in accordance with the design requirements.

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 within 90 days of Final Acceptance.

9.5.2 Project ROW Surveying and Mapping

DB Contractor shall coordinate with TxDOT regarding the assignment of right of way control section job (CSJ) numbers for each new mapping project.

The documents produced by the DB Contractor, or its Subcontractors, are the property of TxDOT, and release of any such document must be approved by TxDOT. All topographic mapping created by DB Contractor shall be provided to TxDOT in digital terrain model format using the software and version thereof being used by TxDOT at the time the mapping is developed.

9.5.3 ROW Monuments

Upon final submittal of the ROW documents to TxDOT, DB Contractor shall set, 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 all ROW lines of the Project including the following:

a. Points of curvature (PCs)
b. Points of tangency (PTs)
c. Points of intersection (PIs)
d. Points of compound curvature (PCCs)
e. Points of reverse curvature (PRCs)
f. All intersecting crossroad ROW lines and all property line intersections with the ROW line. These monuments shall be 5/8-inch iron rods, driven just below surface level, capped by a TxDOT-labeled aluminum cap (rod-and-cap monument)
g. All beginning and ending points of Control of Access (denied) lines.

Upon completion of the ROW acquisition and all construction work, such that the final ROW lines will not be disturbed by construction, DB Contractor shall replace all rod-and-cap monuments located on the final ROW line at all points of curvature (PCs), points of tangency (PTs), points of intersection (PIs), points of compound curvature (PCCs), and points of reverse curvature (PRCs), and all intersecting crossroad ROW lines, with TxDOT Type II monuments (constructed according to TxDOT specifications). DB Contractor shall monument with a TxDOT Type II monument all final ROW lines where the distance between such significant ROW line points exceeds 1500 feet. 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).

DB Contractor shall purchase all materials, supplies, and other items necessary for proper survey monumentation.

DB Contractor shall submit updated maps with the monumentation information. (This is for final monumentation set, for example, type II, and type of monuments set, etc.) All deed recording information shall be added to the map sheets in the ownership blocks on the map sheets.

9.5.4 Record Drawings and Documentation

DB Contractor shall submit the following as part of the Record Drawings and as a condition of 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.
d. Parcels for the ROW maps will be delivered in GPK format.

e. Electronic files and paper copies of the ROW maps will be delivered to TxDOT.

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, pavement and miscellaneous structures, subgrade preparation and stabilization, dust control, aggregate surfacing and earth shouldering, in accordance with the requirements of this Section 10 and the latest version of TxDOT Standard Specifications.

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 after abandonment.

10.2 Preparation within Project Limits

DB Contractor shall develop, implement, and maintain, for the Term, 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 conditions in the Ultimate Scope and Interim Configuration and shall be submitted to TxDOT for approval no later than 60 days prior to the scheduled date for 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 in which the portion of the Project is located, any TxDOT-owned equipment and materials in an undamaged condition. TxDOT reserves the right to require DB Contractor to salvage and deliver to a reasonable location, designated by TxDOT, any ITS equipment and materials in an undamaged condition.

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.

TxDOT reserves the right to remove buildings to level one finished floor or other appropriate condition on ROW acquired by TxDOT for the Project.

10.2.1 Trees within Project ROW

DB Contractor shall preserve trees within the Project ROW to the greatest extent possible. Horizontal clear zone requirements control with respect to the preservation of trees within the specified limits.

10.3 Slopes and Topsoil

DB Contractor shall exercise Good Industry Practice 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 the identified waters of the U.S.

DB Contractor shall perform finished grading and place topsoil to a 4-inch compacted depth 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 next to pavement layers that do not cause water or moisture to accumulate in any layer of the pavement structure.

For designated construction easements and other approved Project Specific Locations (PSLs) outside DB Contractor's limits of maintenance, DB Contractor shall provide stable slopes.

For 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

Block sod shall be placed at all grate inlets, manholes and culvert headwalls.

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 provide the framework for the design and construction of the roadways 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 Contract 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 TxDOT *Roadway Design Manual*.

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

Unless shown to be removed in the Concept Plans, DB Contractor shall maintain all existing property accesses, including those not shown on the Concept Plans, and shall not revise control of access without TxDOT review 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 Table 11-1 (Roadway Design Criteria), with the exclusion of the roadway design deviations listed in Section 11.2.2.2.

Table 11-1 Roadway Design Criteria

	Mainlanes	Frontage Roads	Cross Streets
Functional Classification	Rural arterial	Rural collector	See Attachments 11-1 and 11-2
Design Speed	70 mph	45 mph	See Attachment 11-1
Horizontal Alignment Criteria:			
Maximum Curvature (Min Radius)	3,390 ft	810 ft	711 ft (45 mph)
Superelevation - e(max)	6%	N/A	N/A
Maximum Curvature (Min Radius) w/o Superelevation	14,100 ft	-	-

Vertical Alignment Criteria:			
Maximum Gradient	3.0%	6.0%	7.0%
Minimum Gradient	0.35%[8]	0.35%[8]	0.35%
Crest (min K-Value)	247	61	44 (40 mph) 61 (45 mph)
Sag (min K-Value)	181	79	64 (40 mph) 79 (45 mph)
Maximum Algebraic Difference w/o Vertical Curve	0.5%	1.0%	1.0%
Min Vertical Clearance - Roadway	16.5 ft	16.5 ft	16.5 ft
Min Vertical Clearance - Railroad	23'4"	23'4"	23'4"
Cross Section Criteria:			
Lane Widths	12 ft	12 ft	12 ft[3,5]
U-turn width		25 ft	
Inside Shoulder Widths	4 ft[7]	4 ft (uncurbed)	4 ft (uncurbed)
Outside Shoulder Widths	10 ft	8 ft (uncurbed)	8 ft (uncurbed)
Pavement Cross Slope	0.02 ft/ft	0.02 ft/ft	0.02 ft/ft
Side Slopes			
Within Clear Zone	6:1	6:1	6:1
Outside of Clear Zone	6:1 usual 4:1 max	6:1 usual 4:1 max	6:1 usual 4:1 max
Gore Width - Entrance	-	-	-
Gore Width - Exit	-	-	-
Curb Offset	-	1 ft	1 ft
Clear Zone Width	30 ft	4 ft (curbed) 10 ft (uncurbed)	See Attachment 11-1
Intersection horizontal and vertical criteria:			
Corner Radii	-	50 ft min	-
Design Vehicle (Intersections)	-	WB-50	See Attachment 11-1
Preferred Corner Geometry	-	Curve w/ taper	-

	Ramps	**Direct Connectors (Segment H)**
Functional Classification	-	
Design Speed	50 mph	40 mph
Stopping Sight Distance	425 ft	305 ft
Maximum Curvature (Min Radius)	1050 ft	611 ft
Superelevation – e(max)	6%	6%
Maximum Curvature (Min Radius) w/o Superelevation	7,870 ft[(1)]	5,230 ft[(1)]
Maximum Gradient	4.0%	4.0%
Minimum Gradient	0.35%	0.35%
Crest (min. K-Value)	84	44
Sag (min. K-Value)	96	64

Maximum Algebraic Difference w/o Vertical Curve	0.5%	1.0%
Min Vertical Clearance - Roadway	16.5 ft	16.5 ft
Min Vertical Clearance - Railroad	23'4"	23'4"
Lane Widths	14 ft (one) 12 ft (two)	14 ft (one) 12 ft (two)
Inside Shoulder Widths for Curves	4 ft	4 ft(2)
Outside Shoulder Widths	6 ft	8 ft(2)
Pavement Cross Slope	0.02 ft/ft	0.02 ft/ft
Side Slope - Within Clear Zone	6:1	6:1
Side Slope - Outside of Clear Zone	6:1 usual 4:1 max	6:1 usual 4:1 max
Gore Width - Entrance	6 ft min	6 ft min
Gore Width - Exit	6 ft min	6 ft min
Curb Offset	-	-
Clear Zone Width	16 ft	16 ft
Corner Radii	-	-
Design Vehicle (Intersections)	-	-
Preferred Corner Geometry	-	-
Minimum Gradient	0.35%	0.35%

Notes:

1. 2° 00' curve may be used at mainlanes and direct connector ramps with mainlane cross slope controlling.
2. In those areas where sight distance criteria is not met, an inside shoulder width of 8 ft and outside shoulder width of 4 ft may be used.
3. Harris County has a standard detail permitting the use of 11' lanes, on selected cross-streets. See Attachments 11-1 and 11-2.
4. Clear Zone width for turnarounds shall be 6'.
5. New cross roads or future cross road improvements – 12'; Existing cross roads where no improvements are proposed in in this Project can maintain existing lane widths crossing the Project limits.
6. Where four lane section of divided highway is constructed, the inside shoulders shall include an 8' distance at a 10:1 or flatter slope beyond the edge of the paved shoulder.
7. For sections with two lanes in the same direction. No inside shoulder requirement for mainlane sections with one lane in each direction separated by center stripe.
8. Minimum grade for mainlanes and frontage roads can be reduced to 0.1% when, in accordance with the TxDOT Roadway Design Manual, the pavement is adequately crowned to drain the surface laterally and does not have a curb or barrier rail impeding the flow laterally. Further, when side ditches are required in conjunction with minimum grades, ditch grades shall not be less than 0.5 percent for unpaved ditches and 0.2 percent for lined channels.

DB Contractor shall coordinate, design and construct the improvements on cross streets in accordance with the Governmental Entity having jurisdiction of said roadway. The cross streets shall incorporate the design criteria in the Attachment 11-1 – Cross Street Design Criteria Matrix.

FM 1485 U-turn roadway as depicted in the Concept Plans near Station 1390+00 shall be designed for 20 mph minimum design speed.

11.2.2.1 *Superelevation*

In areas where proposed ramps are to connect to existing pavement, DB Contractor's design may retain existing superelevation. Pavement widening may be constructed by extending the existing pavement cross

slope. Superelevation transitions shall be designed and constructed such that zero percent cross-slopes will not occur on grades flatter than 0.35 percent.

DB Contractor may maintain the existing pavement normal crown in overlay sections so long as it shall not be flatter than 1.5 percent. At normal crowns, DB Contractor shall construct pavement widening adjacent to existing pavement on a 2 percent cross slope. The transition from existing cross slope to 2 percent shall occur within 1-foot of the closest lane line to the roadway widening.

11.2.2.2 *Coastal Water Authority Access Roads*

DB Contractor shall construct service access roads to Coastal Water Authority facilities at canal facility crossings for the authority's Luce Bayou Interbasin canal, North Lateral canal, and Barbers Hill canal. The service access roads shall be 14 feet wide at the driving surface with a minimum 25' horizontal radius, two percent cross slope for drainage, and constructed of an eight (8) inch depth cement treated base in accordance with TxDOT Specification Item 275, Type A, over a six (6) inch depth embankment ordinary compaction in accordance with TxDOT Specification Item 132, Type C. The access road shall have a gate installed by DB Contractor at each canal facility at the top of the bank with lock and key for use by the Coastal Water Authority. The access road where parallel to any cross street, shall be no closer than 30 feet to the ultimate cross street edge of pavement.

Existing maintenance access roadways along the top of berm on both sides of the Lynchburg Canal shall remain and DB Contractor shall not impede Coastal Water Authority channel maintenance activities. A temporary detour may be allowed subject to approval of the Coastal Water Authority. The Coastal Water Authority requires a minimum thirty (30) feet vertical clearance to proposed Project bridge structures to perform maintenance operations on the existing channel unless proposed channel improvements include lining the channel and channel slopes with concrete within the Project ROW, subject to Coastal Water Authority approval. With approved channel lining improvements, a lower roadway clearance may be used in accordance with Table 11-1. The channel flow during construction of channel improvements and bridge structures, shall be maintained at all times and any construction activities within the channel banks shall be supported with calculations demonstrating how flows will be maintained. Where bypass pumping is proposed, DB Contractor shall provide back-up systems and shall demonstrate how the back-up system will be implemented to maintain channel flows if the primary pump system performance is below requirements.

11.2.2.3 *Future Thoroughfares 5B,5C, and Future Industry Rail Spurs*

Future Thoroughfare 5B and 5C shall provide for a future railroad industry spur track. Vertical clearance shall be provided in accordance with Table 11-1 above the industry spur track top of rail elevation and the future top of rail elevation shall be set at a level of four feet above the highest point of existing ground level within the Project ROW at the location of crossing. A lower top of rail elevation may be used if approved by the landowner. Horizontal clearance shall be provided from the centerline of future rail industry spur of 25 feet either side. Bridge substructure may be placed between the railroad industry spur and adjacent roadway provided the 25 feet horizontal clearance is maintained.

11.2.2.4 *Frontage Roads*

DB Contractor shall meet the lane widths shown in Table 11-1 with the exception of the following deviations for frontage road lane width in Segment I-2B:

- EB and WB frontage roads between Lee Drive and ML Wismer shall have 11 feet lane widths as depicted on the Concept Plans

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.

DB Contractor shall design driveways to be functionally adequate for land use of adjoining property and in accordance with the guidelines, which TxDOT will consider requirements for the purpose of this Project, specified in TxDOT's *Roadway Design Manual* – Appendix C, "Driveways Design Guidelines".

The border width, measured from the face of curb to ROW line, along frontage roads and crossing streets shall be 15 feet minimum unless specified otherwise. The Border Width in Segment I-2B from Wyoming Street at Station 85+00 to east of ML Wismer at Station 175+00 may be a minimum of 10 feet. For crossing streets, DB Contractor shall incorporate the design criteria in Attachment 11-2 – Ultimate Cross Street Typical Sections.

DB Contractor shall provide a minimum 46 feet median for all four lane divided mainlane roadways with a continuous cable median barrier separating the mainlane roadways. The placement of the cable median barrier shall be in accordance with *TxDOT Roadway Design Manual*, *Appendix A* and TxDOT standard drawings.

11.2.4 Roadway Design Deviations

The approved roadway deviations are as follows:

11.2.4.1 *Mainlanes*

DB Contractor shall meet the design speed and maximum gradient requirements for mainlanes shown in Table 11-1 with the exception of the following deviations for mainlane design speeds and maximum gradientshown below in Table 11-2.

Table 11-2: Design Deviations for Mainlane Design Speed and Maximum Gradient

Segment I-2B Mainlane Locations	Design Speed	Crest (min. K-Value)	Sag (min. K-Value)	Maximum Gradient
Sta. 96+36 to Sta. 105+68	60 mph	151	136	3%
Sta. 56+00 to Sta. 96+36	45 mph	61	79	4%
Tri-Cities Beach Road to Cedar Bayou	70 mph	247	181	4%

DB Contractor shall meet the maximum horizontal curvature and stopping sight distance for mainlanes shown in Table 11-1 with the exception of the following deviations for mainlane curvature and stopping sight distance shown below in Table 11-3.

Table 11-3: Design Deviations for Mainlane Curvature and Stopping Sight Distance

Segment	Mainlane PI Station Locations	Maximum Curvature (Min Radius)	Design Speed	Inside Shoulder Width
G	Station 1016+15.38	2086	55 mph	12 feet EB
I-2	Station 3072+64.19	2865	60 mph	10 feet WB/NB
I-2B	Station 123+81.79	2050	55 mph	10 feet EB

I-2B	Station 204+60.03	2864.78	55 mph	10 feet WB
I-2B	Station 230+94.60 WB	3000	55 mph	
I-2B	Station 232+10.61 EB	3000	55 mph	10 feet EB
I-2B	Station 290+85.11 WB	2800	55 mph	
I-2B	Station 291+05.21 EB	2900	55 mph	10 feet EB if rail used
I-2B	Station 321+93.24 WB	2864.78	55 mph	10 feet WB if rail used
I-2B	Station 321+93.24 EB	2864.78	55 mph	

11.2.4.2 *Ramps/Local Roads*

Approved design deviations for ramps and identified local roads are provided below in Table 11-4:

Table 11-4: Design Deviations for Ramps/Local Roads

Segment I-1 Ramp Locations	**Design Speed**	**Crest (min. K-Value)**	**Sag (min. K-Value)**	**Stopping Sight Distance**
Loop ramp exit and entrance at US 90	35 mph	29	49	250 ft
Segment I-2B Ramp Locations	**Design Speed**	**Crest (min. K-Value)**	**Sag (min. K-Value)**	**Stopping Sight Distance**
Entrance Wyoming Street to SH 99 NB	35 mph	29	49	250 ft
Exit SH 99 SB to Wyoming Street	35 mph	29	49	250 ft
Local Roads	**Design Speed**	**Crest (min. K-Value)**	**Sag (min. K-Value)**	**Stopping Sight Distance**
Community Drive	25 mph	12	26	155 ft

DB Contractor shall meet the lane width and shoulder requirements shown in Table 11-1 and Attachment 11-1 with the exception of the existing intersection with SH 146 in Mont Belvieu. The initial build for the intersection at SH 146 shall match existing pavement and the roadway striping may be revised to provide a minimum 4 feet shoulders and a minimum eleven (11) feet lanes as required to provide left turn lanes to SH 99 entrance ramps.

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 are revised during the Project design, then DB Contractor shall design and construct a solution that does not have adverse impact to property owners outside the ROW.

12.1.1 Project Specific Requirements

DB Contractor is generally not permitted to increase existing water surface elevations at stream crossings outside the Project ROW and at any cross section along the streams. Increases in existing water surface elevations if contained within drainage channels or storm drain systems and if no adverse impacts result to adjacent properties will be permitted if DB Contractor provides a written approval from the jurisdictional flood control agency for a specific stream crossing location.

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.

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; in FEMA mapped floodplains including models and other supporting documents; and official documents concerning the Project, such as the FEIS and 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 and corresponding estimated runoff that contribute to the existing highway drainage system.

DB Contractor shall obtain photogrammetric and/or geographical information system (GIS) data for the Project limits that depicts the Outstanding National Resource Waters and/or impaired waters as listed by the Texas Commission on Environmental Quality (TCEQ). DB Contractor shall conduct surveys for information not available from other sources.

If documentation is not available for elements of the existing drainage system within the Project limits and scheduled to remain in place, DB Contractor shall investigate and videotape or photograph the existing drainage system to determine condition, size, material, location, and other pertinent information.

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 interests and regulatory agencies. DB Contractor shall document the resolutions of water resource issues.

DB Contractor shall provide to the local floodplain administrators all information and technical data needed to file Letters of Map Revision (LOMR) and Conditional Letters of Map Revision (CLOMR) with FEMA.

12.3 Design Requirements

DB Contractor shall design all Elements of the drainage facilities in accordance with this Section 12 and design criteria in the TxDOT Hydraulic Design Manual supplemented by the applicable design criteria from the Montgomery County Criteria Manual and the Drainage Criteria Manual for Chambers County for Elements of the drainage facilities that reside in each respective county provided that the most stringent of the applicable criteria is met between TxDOT and the respective county requirements.

DB Contractor shall provide facilities compatible with existing drainage systems and all applicable municipal drainage plans and/or approved systems in adjacent properties. DB Contractor shall preserve existing drainage patterns wherever possible.

The DB Contractor shall provide a drainage system that maintains or improves the existing 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 within the Project limits scheduled to remain in place must meet hydraulic capacity requirements as detailed in Section 12. If any Elements of the existing system do not comply with the requirements of Section 12 (Drainage) or Section 13 (Structures), those Elements shall be replaced by DB Contractor.

The design of drainage systems shall meet the performance requirements as defined in this Section 12. If DB Contractor proposes a drainage system to tie to an existing drainage system, the DB Contractor shall design and reconfigure the connecting existing system, as necessary, to ensure the proposed system meets the performance requirements as defined in this Section 12 while maintaining or improving the performance of the connected existing drainage system.

DB Contractor shall base its Final Design on design computations and risk assessments for all aspects of Project drainage.

12.3.1 Surface Hydrology

12.3.1.1 *Design Frequencies*

DB Contractor shall use the design frequencies listed in Table 12-1 on the following page. Abbreviations used in the table are explained below.

AHW	Allowable High Water	HOU	District Design Practice
HCFCD	HCFD Policy Criteria & Procedure Manual	RCB	Reinforced Concrete Box
HDM	Hydraulic Design Manual (TxDOT)	RCP	Reinforced Concrete Pipe
HGL	Hydraulic Grade Line	WSEL	Water Surface Elevation

Table 12-1: Drainage Design Frequencies

Design Element	Reference	Mainlanes	Ramp	Direct Connect.	Frontage Road	Arterial / Cross Street	Application Notes
Minimum Roadway Elevation at AHW	HDM – Ch 4, Sec 6 TxDOT HOU	100-yr	10-yr	100-yr	10-yr	10-yr	Applies to cross drainage and parallel floodplain WSEL. Does not apply to storm drain HGL
Storm Drain Inlets and Pavement Drainage	HDM – Ch 4, Sec 6 TxDOT HOU	10-yr	2-yr	10-yr	2-yr	2-yr	Applies to ponded widths in gutter and inlet capacity.
Storm Drain Conduits	HDM – Ch 4, Sec 6 TxDOT HOU	2-yr	2-yr	2-yr	2-yr	2-yr	Size conduit for non-pressure flow; i.e. Design Q<= Full Flow Capacity Q. Check mainlane storm sewer for 10-year capacity
Cross Drain Culverts	HDM – Ch 4, Sec 6 TxDOT HOU	50-yr	10-yr	50-yr	10-yr	Match Exist.	Design upstream WSEL below AHW at low point in roadway profile. Check for 100-year.
Bridge Waterway Crossing	HDM – Ch 4, Sec 6 HDM – Ch 9, Sec 3 TxDOT HOU	100-yr	10-yr	50-yr	10-yr	Match Exist.	New ML Bridge: 1.5' or greater freeboard for the 100-year. 1.0' may be used with TxDOT's prior concurrence. Other Roadways: Low chord > Design WSEL
Storm Water Pumping Stations	HDM – Ch 11, Sec 3	50-yr	50-yr	50-yr	50-yr	50-yr	Design WSEL below AHW. Check for 100-year.
Outfall Ditches	TxDOT HOU	Design for No Impact to 100-yr WSEL. Use HCFCD and Montgomery County Standard Details for Outfalls and other construction within HCFCD Montgomery, Liberty and Chambers Counties channels and ponds.					
Separation Ditches*	TxDOT HOU	10-yr	10-yr	10-yr	N/A	N/A	*Separation Ditches are those in medians between adjacent roadbeds
Roadside Ditches***	TxDOT HOU	N/A	N/A	N/A	2-yr*	2-yr**	*If required outside curb line. **Or match existing capacity. *** Roadside ditches are those between the roadbed and ROW
Detention Ponds	TxDOT HOU	100-year design. Provide Detention Summary with Area Serviced, Detention Storage Volume Required, Detention Storage Volume Provided, Maximum Design WSEL, Maximum Outflow Rate Allowed, Maximum Outflow Rate Provided, and Restrictor Size.					Sample plans are available from TxDOT upon request.
Depressed Roadway* Storm Sewer (gravity drainage without pump)	HDM – Ch 4, Sec 6 TxDOT HOU	50-yr	10-yr	50-yr	10-yr	10-yr	*Depressed roadway has nowhere for water to drain when curb height is exceeded. Check for 100-yr HGL.

12.3.1.2 *Hydrologic Analysis*

DB Contractor shall design drainage structure capacities for the frequencies and hydrologic conditions as described in Table 12-1.

DB Contractor shall design the drainage system to accommodate increased runoff due to the roadway improvements within the Project ROW. Flood damage potential for the completed Project shall not exceed pre-Project conditions.

When determining flow for conduits from outside the Project ROW the flow shall be the greater of (a) the contributing drainage area at existing development conditions, or (b) the 150' development strip adjacent to the right of way using a runoff coefficient of 0.65. Peak flows from existing development with compensatory onsite stormwater detention shall consider the flow reduction benefits of the stormwater detention.

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, 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. Drainage area maps for each storm drain inlet with pertinent data, such as boundaries of the drainage area, 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.
b. Location and tabulation of all existing and proposed pipe and drainage structures. These include size, class or gauge, catch basin spacing, detailed structure designs, and any special designs.
c. Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and pipe alternates.
d. 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.

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 no higher than one foot below:

a) the lip of gutter;
b) the top of grate inlet; and
c) the top of manhole cover.

Runoff within the jurisdiction of the U.S. Army Corps of Engineers (USACE) shall be conveyed in accordance with applicable Laws and permits.

12.3.2.1 *Drainage Design*

DB Contractor shall use the design criteria listed in Table 12-2 on the following page. Abbreviations used in the table are explained below.

AHW	Allowable High Water	RCB	Reinforced Concrete Box
HDM	Hydraulic Design Manual (TxDOT)	RCP	Reinforced Concrete Pipe
HOU	District Design Practice		

Table 12-2: Drainage Design Criteria

Design Element	Reference	Toll Lanes /General Purpose Lanes	Ramp	Direct Connect.	Frontage Road	Arterial / Cross Street	Application Notes
Storm Drain Conduits – Laterals							
Minimum Pipe Size	TxDOT HOU	24”	24”	24”	24”	24”	
Minimum Slope	TxDOT HOU	0.2%					
Maximum Slope	TxDOT HOU	3%					
Minimum Velocity	TxDOT HOU	2 ft/sec at full flow					
Maximum Velocity	TxDOT HOU	10 ft/sec					
Storm Drain Conduits – Trunk Lines							
Minimum Pipe Size		24”	24”	24”	24”	24”	
Minimum RCB Depth		3'	3'	3'	3'	3'	
Minimum Slope		0.2%					
Maximum Slope		3%					
Minimum Velocity		2 ft/sec at full flow					
Maximum Velocity		10 ft/sec					
Separation Ditches/Roadside Ditches							
Minimum Depth		Variable					
Maximum Depth		Dictated by roadway design					
Minimum Slope		0.1% if grass lined or pavers, 0. 1% if lined with concrete					
Maximum Slope		Based on shear stress of lining					
Maximum Flow Depth		Top of bank					
Side Slopes/Shape		Based on roadway design criteria and typical section					
Pavement Drainage							
Allowable Ponding Width/AHW	HDM – Ch 10, Sec 2 TxDOT HOU	Shldr Width	Shldr Width + 2'	Shldr Width + 2'	Curb offset + 1 Lane	Curb offset + 1 Lane*	

Design Element	Reference	Toll Lanes /General Purpose Lanes	Ramp	Direct Connect.	Frontage Road	Arterial / Cross Street	Application Notes
Maximum Low Point Ponding Depth	HDM – Ch 10, Sec 4	Function of Allowable Ponding Width and Cross Slope					Provide flank inlets to avoid hydroplaning.
Storm Drain Inlets							
Pavement Inlet Types	TxDOT HOU	AZ, AZ2G, AZR, AZR2G, Trench Drains[1]	AZ, AZ2G, AZR, AZR2G, C or C1	AZ, AZ2G, AZR, AZR2G	C1 (typical)	C, C1	1. Use Trench Drains in ramp gores.
Ditch Inlet Types	TxDOT HOU	Separation Ditches: AD, AAD, SET Side Road Ditches: A, AD, AAD, SET					Provide detail to add concrete riprap collar 2'-wide around inlet perimeter.
Inlet Drainage Area	TxDOT HOU	In general, contributing drainage area to the inlet from within and outside the right of way, with following clarifications: 1. For Frontage Road inlets Adjacent to **Undeveloped Areas Outside Right Of Way :** Contributing area within the right of way, plus 150' strip outside right of way at an assumed runoff coefficient 'C' = 0.65 2. For Frontage Road inlets Adjacent to **Developed Areas (with internal drainage system) Outside Right of Way:** Contributing areas within and outside right of way. 3. Drainage area for storm drain conduits may differ (see 'Conduit Drainage Area' below).					
Inlet Locations	HDM – Ch 10 – Sec 5 TxDOT HOU	1. On-grade: Place inlets to keep gutter ponding <= allowable, Carryover acceptable. 2. Low points: Verify inlet location is at sag of vertical curve, not at P.I. Place flanking inlets both sides of low point at maximum 100' spacing from L.P. 3. Redundant inlets: End of curb returns at intersection, and in separation ditches. 4. 100% flow interception: On pavement at end of retaining wall, at ramp gores, at intersections. 5. Provide detail for equalizer pipes to connect multiple boxes in trunkline at inlets.					
Bridge Deck Drainage	HDM – Ch 9 – Sec 7 TxDOT HOU	1. Drain free-fall through slots in rail, where falling water would not affect adjacent roadway/bridge or other features below. 2. Use Bridge Drain Inlets per Houston District Bridge Section details, where drainage through slots in rail is not acceptable. 3. Use slotted rail w/water blocks in sag locations. 4. Outfall deck drain pipe system directly into nearby storm drain inlet or manhole below grade,if available. Otherwise, outfall pipe from base of column into adjacent ditch collection system in a manner that prevents erosion.					
Storm Drain Conduits - General							
Conduit Drainage Area	TxDOT HOU	In general, contributing drainage area to the conduit from within and outside the right of way, with following clarifications: 1. Flows to the conduit from areas outside the right of way are based on the higher of (1) contributing area at existing development conditions or (2) 150' strip adjacent to right of way at runoff coefficient 'C' = 0.65 2. 'Existing development conditions' in #1 shall consider effect of any existing stormwater detention. 3. Drainage area for storm drain inlets may differ (see 'Inlet Drainage Area' above).					
Conduit Material/Type	TxDOT HOU	Reinforced Concrete Pipe – RCP, or Reinforced Concrete Box - RCB					

Design Element	Reference	Toll Lanes /General Purpose Lanes	Ramp	Direct Connect.	Frontage Road	Arterial / Cross Street	Application Notes
Design Conduit Size	HDM – Ch 10, Sec 6	Full flow pipe capacity >= design Q					
Conduit Size Changes	HDM – Ch 10, Sec 6	Match soffits at conduit size changes, if possible. Matching flowlines is acceptable if grade is limited.					
Manholes/Junctions	TxDOT HOU	Ty A or Ty B Manholes. Bridge Division Manhole Ty M, JB w/Access. All other JB's require special design.					No MH access on pavement. Provide MH spacing per TxDOT HDM.
Conduit Connections	TxDOT HOU	1. Lateral stub-in boxes require 2' minimum size differential 2. Pipe to pipe stub-in requires 3' minimum size differential 3. Other connections require M/H, JB, or JB w/out riser 4. Provide detail for accommodating multiple (parallel) conduits at junctions – use equalizer openings					
Minimum Conduit Clearance (Cover)	TxDOT HOU	1. Graded areas: 1 ft 2. Paved areas: the lower of (a) 2 ft below pavement surface, or (b) below treated subgrade.					
Location near Retaining Wall	TxDOT HOU	1. Where possible, avoid placement of conduit parallel to MSE wall if located within wall backfill. 2. Preferred lateral placement is under wall, normal to wall alignment (see AZR and AZR2G inlet standards). 3. If conduits are outside of and parallel to a fill wall, offset conduit 15 ft minimum from face of wall.					

12.3.3 Stormwater Storage Facilities

DB Contractor shall complete preliminary design of the stormwater storage facilities to meet requirements for water quality, water quantity, and rate control, as determined by the Texas National Pollutant Discharge Elimination System (NPDES) regulations. If local requirements are more stringent, DB Contractor shall design stormwater storage facilities in compliance with those local requirements. DB Contractor shall be responsible for developing and executing any third party agreement required to meet more stringent requirements. DB Contractor shall include TxDOT in any coordination with third parties.TxDOT shall have the opportunity to participate in coordination meetings if so desired.

DB Contractor shall ensure that stormwater storage facilities meet the requirements listed above by performing all required analyses. The analyses shall confirm that post-Project peak runoff rates do not exceed pre-Project peak runoff rates.

12.3.4 Hydraulic Structures

12.3.4.1 *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.

The hydraulic analysis shall include a thorough investigation of field conditions and appropriate survey data to develop hydraulic models to evaluate water surface elevations, velocities, and floodplain boundaries. It shall also include a scour analysis to determine scour depths, and develop countermeasures.

Where culvert design is influenced by upstream storage, the analysis of the storage shall be incorporated into the design of the culvert.

For all culverts, the maximum allowable headwater elevation for the design frequency shall not exceed one foot below the shoulder point of intersection elevation of the applicable roadway low point. The maximum allowable velocity shall not surpass six (6) feet per second (FPS). If this value is exceeded, velocity protection devices shall be used to protect the channel from erosion damage.

For Coastal Water Authority facilities, analysis is not required if the following minimum culvert sizes are used or sizes are exceeded:

- Northwest Lateral (Relift Canal) – Two (2), 48 inch pipes minimum
- Barbers Hill Canal – Four (4), 48 inch pipes minimum

12.3.4.2 *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.

See Section 12.3.1.1 for additional design requirements.

12.3.4.2.1 Method Used to Estimate Flows

DB Contractor shall ensure that the selected hydrologic method is appropriate for the conditions in the watershed. For all crossings located within a FEMA Flood Insurance Study (FIS) area with peak flow information, DB Contractor shall gather and utilize, as appropriate, the flow information provided in the FIS and any subsequent Letters of Map Revision (LOMR) for estimating flow. For channel crossings within Harris County the DB Contractor shall obtain the effective hydrologic and hydraulic model, if available, from the Harris County Flood Control District (HCFCD).

For crossings not located within a FEMA FIS area, DB Contractor shall select the appropriate method for calculating the design flows based on site conditions, and applicable design criteria in the TxDOT *Hydraulic Design Manual* or the applicable design criteria requirements for local third parties if they are more stringent than those in the *TxDOT Hydraulic Manual*.

12.3.4.2.2 Design Frequency

Bridge waterway crossings, bridges, culverts and storm drain systems shall be designed for the design-year frequency corresponding to the functional classification of the associated roadway.

DB Contractor shall estimate the peak discharge, for both, existing and proposed condition; water surface profiles for design and check flood conditions will have to be determined. Higher freeboards may be required when the stream is prone to heavy debris loads, or to accommodate other clearance needs.

12.3.4.2.3 Hydraulic Analysis

DB Contractor shall evaluate bridges for contraction scour and pier scour concerns and incorporate protection as required. DB Contractor shall provide a scour analysis in accordance with TxDOT's *Geotechnical Manual* (Chapter 5 – Section 5 Scour) for all new 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 Guidan*ce.

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.

12.3.4.2.4 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. If this condition is not met, DB Contractor shall design a replacement structure with sufficient capacity to pass the design-frequency flows and ensure the maximum headwater does not cause an adverse impact. 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 maintain the existing channel morphology through the structure, if possible.

12.3.4.2.5 Bridge Deck Drainage

Runoff from bridge decks shall be carried off the bridge and into the adjacent roadway drainage system using bridge deck drains, slots in the rail, and/or capture in bridge approach drains to intercept gutter flow at each end of the bridge according to Bridge Deck Drainage criteria in the Storm Drain Inlets section of Table 12-2.

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 regulation prior to discharge to the natural waters of the State.

12.3.4.2.6 Drainage Report for Major Stream Crossings

As part of the Drainage Design Report, DB Contractor shall prepare a study for each major stream crossing. Major stream crossings are waterways with a FEMA studied Special Flood Hazard Area (SFHA) 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. The study 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 study shall include:

FEMA Special Flood Hazard Area (SFHA)

a) FIRMette
b) Discussion of SFHA and implications

Hydrology

a) Drainage area maps with watershed characteristics, hardcopy
b) Hydrologic calculations (where computer software is used, both hardcopy and electronic input and output files)
c) Historical or site data used to review computed flows

Hydraulics and Recommended Waterway Opening and/or Structure

a) Photographs of 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)
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
d) Recommendation for abutment protection

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 preliminary design of all components that will be included in the final Drainage Design Report. With the final design submittal and at least 30 days prior to construction of any drainage element, the DB Contractor shall submit a Drainage Design Report for the drainage element to TxDOT.

Within 30 days of Substantial Completion, DB Contractor shall submit to TxDOT, as part of the record set documents, a final Drainage Design Report, which shall be a complete documentation of all components of the Project's drainage system. At a minimum, the final Drainage Design Report shall include:

a) Record set of all drainage computations, both hydrologic and hydraulic, and all support data.
b) Hydrologic and hydraulic notes, models, and tabulations (where computer software is used, both hardcopy and electronic input and output files)
c) Bridge and culvert designs and reports for major stream crossings
d) Pond designs, including graphic display of treatment areas and maintenance guidelines for operation
e) Correspondence file
f) Drainage system data (location, type, material, size, and other pertinent information) in a suitable electronic format
g) Storm sewer drainage report

12.5 Construction Requirements

DB Contractor shall design drainage to accommodate construction staging. The design shall include temporary erosion control ponds 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.

13 STRUCTURES

13.1 General Requirements

The structural Elements of the Project, including bridges, culverts, drainage structures, signage supports, illumination assemblies, traffic signals, retaining walls, and sound walls, shall be designed and constructed in conformance with the requirements of the Contract Documents, 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 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, 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 100-year service life for Project bridges, walls, culverts and miscellaneous structures. Bridges, retaining walls, sound walls and sign structures shall be designed in conformance with the *Houston District Green Ribbon Project Design Guidelines for the Construction of Highways, Streets and Bridges (Green Ribbon Project Guidelines)*.

DB Contractor shall submit to TxDOT an inventory and operating ratings of constructed structures with the Record Drawings.

13.2 Design Requirements

DB Contractor shall obtain National Bridge Inventory (NBI) numbers from TxDOT for all bridges and bridge class culverts. The NBI numbers shall be shown on the applicable layout sheets of the Final Design Documents.

13.2.1 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* and the most recent AASHTO *LRFD Bridge Design Specifications*, including all interim revisions. Sidewalks shall be provided on bridge structures in accordance with Section 20 – Bicycle and Pedestrian Facilities of these Technical Provisions.

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 *Guide Specifications for Design of Pedestrian Bridges*.

DB Contractor shall inspect all structures to be reused, widened, or modified in accordance *with AASHTO Manual for Bridge Evaluation* and *TxDOT Bridge Inspection Manual*.

The DB Contractor shall proportion bridge spans to avoid uplift at supports.

DB Contractor shall ensure that bridges crossing over waterways withstand a 100-year frequency event with no loss of structural integrity.

Mainlane bridges over cross streets shall, at a minimum, be designed to accommodate the cross street typical section width and all planned expansions as detailed in Attachment 11-1 – Cross Street Design Criteria Matrix.

For situations where roadways cross over the mainlanes, alignments shall meet the design criteria presented in Section 11 for the functional classification of each roadway. DB Contractor shall design bridge structures to span the Interim Configuration and Ultimate Scope. Direct-connect structures shall be constructed to satisfy the Ultimate Scope. In locations where the Interim Configuration does not call for the construction of direct-connect structures, DB Contractor shall make provisions to accommodate the future construction of direct-connect structures for the Ultimate Scope.

All electronic and paper files and calculations design notebooks shall be made available at TxDOT's request.

13.2.2 Bridge Design Loads and Load Ratings

a. Live Loads
   All new and widened portions of roadway bridges and new or lengthened bridge class culverts shall be designed to accommodate the following live loads:
   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.
   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*, 17th edition to account for maintenance and emergency vehicles.
b. Additional Loads
   Bridges (except pedestrian bridges) shall also be designed to accommodate a minimum future overlay load of 25 psf.

DB Contractor shall provide to TxDOT both an inventory and an operating rating of the constructed structures using a form provided by TxDOT. Load ratings shall be in accordance with AASHTO's *Manual for Condition Evaluation of Bridges*.

13.2.3 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 the Federal Highway Administration (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. Joints for all grade separation structures shall be sealed.

DB Contractor shall design sidewalks to meet the criteria of the AASHTO *Roadside Design Guide* and protect sidewalks from vehicular impact by a TxDOT-approved bridge railing as required in the TxDOT

Bridge Railing Manual based on roadway Design Speed. For the Project, pedestrian rail shall be used along structure pavement edges and installed to minimize future damage when accommodating the Ultimate Scope.

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'-0" 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.
d. The design, detail and construction of segmental bridges shall provide for the easy addition of supplemental post-tensioning.

13.2.4 Bridge Foundations

Integral abutments, where the superstructure is structurally framed (either completely or partially) into the abutment, shall not be permitted. Mechanically Stabilized Earth (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 shall be designed and constructed to mitigate settlement immediately behind abutment backwalls.

DB Contractor's bridge span arrangement and foundation locations shall accommodate the Ultimate Scope.

At cross streets, overpass bridge structures shall clear span all intersection pavement including through lanes and turn lanes. Bridge foundations and columns may be located between the cross street pavement and turnarounds.

Spread footing foundations are not allowed.

Houston District Cement Stabilized Backfill Embankment (CSBE) standards shall be incorporated when continuously reinforced concrete pavement (CRCP) is used at bridge approaches.

13.2.5 Bridge Railing and Barriers

All barrier systems used on the Project shall meet current crash test 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 Attachment 13-1, TxDOT Standard Bridge Railing. DB Contractor shall protect sidewalks from vehicular impact by using TxDOT-approved bridge railings. For interim configuration, pedestrian rail shall be used along structure pavement edges and installed to minimize future damage when accommodating the Ultimate Scope.

13.2.6 Retaining Walls

To the extent possible, DB Contractor shall design and construct components of the 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 Scope can be implemented with little to no rework or impact on traffic. The interim foundations for the retaining walls shall be designed and constructed to accommodate any additional height and weight associated with the Ultimate Scope.

Wall types and components 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 wall type and components shall meet the functional requirements of the Project.

Modular walls employing interlocking blocks shall not be used where surcharge loads from vehicular traffic are present.

Metal walls, including bin walls and sheet pile walls, recycled material walls and timber walls are not allowed except at Goose Lake where the proposed wall type can be similar to existing walls.

Mechanically Stabilized Earth (MSE) Retaining Walls shall be designed in accordance with Houston District Standards.

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) specifications*, 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 MMP and Good Industry Practice.

The retaining wall layout shall address slope maintenance above and below the wall.

If pipe culverts are to extend through the retaining walls or noise walls, 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.

13.2.7 Noise/Sound Walls

DB Contractor shall design and construct the noise/sound walls to achieve the decibel reduction requirement in the NEPA Approval(s) and the aesthetic requirements in Section 15, Aesthetics and Landscaping, and the *AASHTO LRFD Bridge Design Specifications*.

Timber sound walls are not allowed.

13.2.8 Drainage Structures

In developing the design of drainage structures, DB Contractor shall account for maximum anticipated loadings in both the Interim Configuration and Ultimate Scope.

Energy dissipaters, if used, shall be considered as structural Elements.

13.2.9 Sign, Illumination, and Traffic Signal Supports

For bridges and walls longer than 500 feet, DB Contractor shall provide sign supports at 500-foot intervals. The sign supports shall accommodate sign areas up to and including 16 square feet. DB Contractor shall design overhead and cantilever sign supports to accommodate the Ultimate Scope. Cantilever and sign bridge supports shall be placed outside the clear zone or shall be otherwise protected by appropriate safety measures.

13.2.10 Widenings

DB Contractor shall complete a load rating and condition survey of existing structures to be widened according to TxDOT's latest *Bridge Development Manual, Chapter 4, Advanced Planning*. DB Contractor shall show both the existing and widening load rating and design loads on the bridge plans.

13.2.11 Structures to be Used in Place or Rehabilitated

For existing structures to be used in place or rehabilitated, DB Contractor shall perform a condition survey including the location, condition rating, remaining service life and recommended mitigation measures.

13.3 Construction Requirements

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 the TxDOT *Standard Specifications* shall be applied to the following at 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.

13.3.2 Structure Metals

Welding shall be in accordance with the requirements of the *AASHTO/AWS DI.5 2010 Bridge Welding Code* and latest interim revisions.

13.3.3 Steel Finishes

Except for weathering steel, all structural steel shall be protected in accordance with Item 446 of TxDOT *Standard Specifications, "Field Cleaning and Painting Steel"*. 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.

14 RAIL

14.1 General Requirements

The Project includes multiple rail corridor crossings within the Project ROW as depicted on the Concept Plans. This section sets forth criteria for Work impacting existing railroad ROW and to accommodate and/or construct rail facilities.

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. 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 the respective railroad, State and federal Law and the practices, guidelines, procedures and methods contained in the TxDOT *Rail-Highway Operations Manual, August 2015*. Additionally, the requirements of the owner of each facility crossed shall be compared to the requirements in the TxDOT manual, and the most restrictive criteria shall be utilized.

DB Contractor shall adhere to practices and guidelines established in the BNSF Railway – Union Pacific Railroad *Guidelines for Railroad Grade Separation Projects*, found at the following site:

http://www.up.com/cs/groups/public/@uprr/@customers/@industrialdevelopment/@operationsspecs/@specifications/documents/up_pdf_nativedocs/pdf_up_str_grade-separation.pdf.

The structural design of any Utilities, including drainage structures, installed by the 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.

14.2.1 Design Criteria

Unless otherwise approved by the operating railroad, the minimum vertical clearance as shown in Section 11-Roadways shall be required over the entire railroad ROW within the Project limits. For the purposes of establishing minimum vertical clearance, top-of-rail elevations shall be determined by measuring the high point of the rail within 1000 feet on either side of the roadway centerline; this elevation shall be field verified. If the track grade is in a sag, then the required clearance will be determined using an average top of rail elevation, as defined by the operating railroad.

DB Contractor shall avoid placement of temporary or permanent project components inside railroad ROW to the extent possible. Any such placements inside railroad ROW require approval of the operating railroad. The DB Contractor shall be responsible for attaining required approvals.

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 be responsible for executing any required payment agreements with the railroad to reimburse the railroad for required activities during construction, such as flagging and inspection. These agreements shall be between DB Contractor and the railroad.

For any preliminary activities on railroad ROW, DB Contractor shall be responsible for executing any necessary agreements with the railroad to enter railroad property and authorize railroad to provide flagging. DB Contractor will be responsible for any fees associated with these activities.

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 12 months or more to obtain from the railroad company. Current approved templates for TxDOT/railroad company agreements are available from the TxDOT.

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. These agreements shall be between DB Contractor and the railroad. DB Contractor shall prepare and be responsible for executing any required preliminary engineering agreements with the railroad to reimburse the railroad for preliminary engineering and estimating performed by the railroad or their consultant(s) included attending project meetings, reviewing and approving designs, and developing any necessary cost estimates;

(b) License to Cross and C&M Agreement (License 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. DB Contractor shall prepare all the documents required to obtain the License 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 Agreement to TxDOT for transmittal to the railroad. TxDOT shall have the opportunity to comment on any submittals, and DB Contractor shall respond to all comments in writing. TxDOT will not proceed with the C&M Agreement until sufficient resolution is reached on all comments. 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; and

(c) Railroad's Contractor Right-of-Entry Agreements (Texas approved versions only) – In order to enter the railroad's ROW 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.

Documentation for agreements shall include:

- Exhibit A plan set documenting all demolition and construction activities within the railroad ROW
- Metes & bounds legal property description for the proposed bridge footprints within the railroad ROW (if required by the railroad)
- Design conformance to railroad guidelines report
- Boring logs in the vicinity of the Work

- Photos of area adjacent to railroad
- Hydraulic analysis (if required by the railroad)

The D/B Contractor shall incorporate railroad coordination activities into the Project Schedule. Such activities include, but are not limited to:

- Design meeting with the Railroad and TxDOT
- Development and execution of agreements for preliminary activities (boring, surveying, etc)
- Development and execution of preliminary engineering agreement (if required by the Railroad)
- Development of Exhibit A and support documentation
- Review of Exhibit A and support documentation and resolution of comments by TxDOT
- Development of 100% plans and resolution of comments by Railroad

All executed agreements shall be submitted in their entirety as part of the Final Design Documents

14.3.2 Project Work Affecting Railroad Operations

If the Project crosses railroad ROW owned by an operating railroad, DB Contractor shall coordinate the Work with the operating railroad or lessor of that line/property. DB Contractor shall be responsible for obtaining the required approvals, permits, and agreements as required for the railroad-related Work.

14.3.3 Operation Safety

DB Contractor shall arrange for railroad flagging as required with the operating railroad. 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 and shall maintain current registration at all times while working on railroad property.

If not detailed in the respective railroad's right of entry agreement or if not directed otherwise by the respective railroad, DB Contractor shall notify the respective railroad representative in writing at least ten (10) Business Days in advance of DB Contractor commencing its Work adjacent to railroad ROW and at least thirty (30) Business Days in advance of any Work by DB Contractor in which any person or equipment will be within twenty-five (25) feet of any track or will be near enough to any track that any equipment extension such as, but not limited to, a crane boom will reach within twenty-five (25) feet of any track. No Work of any kind shall be performed, and no person, equipment, machinery, tool(s), material(s), vehicle(s), or thing(s) shall be located, operated, placed, or stored within twenty-five (25) feet of any track(s) unless authorized in writing by the railroad. Upon receipt of such thirty (30)-day notice, the railroad representative will determine and inform DB Contractor whether a flagman need be present and whether DB Contractor needs to implement any special protective or safety measures.

14.3.4 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 railroad ROW as necessary for rail maintenance and operations activities, inspection, repair and emergency responses.

14.3.5 Insurance Requirements

DB Contractor shall procure and maintain, prior to working adjacent to and entry upon operating railroad property, insurance as per Exhibit 14 of the DB Agreement.

All insurance policies shall be in a form acceptable to the operating railroad. Copies of all insurance policies shall be submitted to TxDOT by DB Contractor prior to any entry upon operating railroad property.

14.4 Construction Requirements

DB Contractor shall comply with all construction requirements and specifications set forth by the operating railroad and shall invite the appropriate railroad company to all pre-construction meetings

DB Contractor shall be responsible for coordinating and scheduling the work to be completed by 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.

Coordination Activities during construction include, but are not limited to:

- Pre-construction meeting
- Development of demolition plan and resolution of comments by railroad
- Issuing any authority to order materials or work orders to the railroad as stated in the C&M Agreement
- Demolition and construction in railroad ROW
- Review and payment of all invoices from the railroad

14.4.1 Flagging

DB Contractor shall arrange for and be responsible for all costs associated with railroad flagging, as required with the railroad company, to ensure the safe passage of rail traffic throughout the Project Limits effecting railroad ROW.

14.4.2 Safety Certification

DB Contractor shall comply with the railroad's requirements for contractor safety training prior to performing Work or other activities on the railroad's ROW and shall maintain current registration while performing work on railroad property.

15 AESTHETICS AND LANDSCAPING

15.1 General Requirements

This Section 15 defines requirements with which DB Contractor shall design and construct aesthetic treatments for the roadway, structures, drainage, and landscaping Elements of the Project. Aesthetic treatments shall be designed to harmonize with the local landscape and architecture, as well as the developed themes of the local setting. DB Contractor shall coordinate with local and State agencies to achieve this harmonization. All costs for aesthetic treatment shall be included in the price of the Element(s) receiving the aesthetic treatment.

A landscaping allowance has been included for the Project as referenced in Section 12.1.6 of the Agreement. The allowance shall be limited to furnishing and installing landscaping Elements but not inclusive of top soil, seeding and sodding. All design tasks including but not limited to developing landscape Concept Plans, detailed landscaping plans, estimating and pricing any alternates, re-design of detailed landscape plans to accommodate allowance budget, etc. are excluded from the landscaping allowance. The construction elements excluded from the landscaping allowance are cost of furnishing and installing hardscape, cost of furnishing and installing irrigation systems, cost of installing water lines, permits and the cost to irrigate, etc. Cost related to maintenance of landscaped areas is also excluded from the landscaping allowance.

15.2 Administrative Requirements

This Section 15 presents minimum aesthetics and landscape design requirements for Project designs. For purposes of this Section 15, the following list of items will be considered the aesthetics 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. Paved slope treatments
d. Finish, color, and texture of retaining and noise walls
e. Contour grading, slope rounding, channel treatments, and drainage
f. Sculptural and artistic features of other structures
g. Sidewalks, median or pedestrian specialty paving, including material, finish, and color
h. Hardscape at interchanges and intersections
i. Fencing
j. Signage – overhead, attached, and ground-mounted
k. Gantries
l. Any permanent building construction within the Project, including ancillary support, operational, and toll collections
m. Light fixture, ambient light colors, and general layout conditions
n. Landscaping

15.2.1 Aesthetics Concepts

Aesthetic elements shall be designed as corridor-wide enhancements. 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 use the *Green Ribbon Project Guidelines* and approved Houston District Standards as the basis for the development of the aesthetics on the corridor. DB Contractor shall use the wave scheme for segment I-2 and Segment I-1 from SH 146 in Mont Belvieu to I-10, and the vertical scheme

for segments H and I-1 from US 90 to north of SH 146 approximate Concept Layout Station 2810+00, as provided in these guidelines as the concepts for the corridor. The Interchange scheme, as per the *Green Ribbon Project Guidelines*, and approved Houston District Standards shall be followed at the I-69/US 59 and I-10 interchanges. DB Contractor shall prepare the aesthetics concept of the Project that provides design intent for presentation to local communities and Customer Groups. It shall be understood that these concepts may need to be adapted to site specific conditions. DB Contractor shall base presentation on the principles, and approved standards for presentation to local communities and Customer Groups. DB Contractor shall base this presentation on the principles, requirements, and strategies provided in Section 15.3 (Design Requirements).

Before presenting the aesthetics concepts to the public, DB Contractor shall meet and review the proposed aesthetics concepts with TxDOT. After meeting with the public, DB Contractor shall prepare a final aesthetic concept and submit it to TxDOT for approval within 90 Days of issuance of NTP1. The approved aesthetic concept shall be incorporated into the *Aesthetics and Landscaping Plan(s)* for TxDOT approval.

15.2.2 Aesthetics and Landscaping Plan

DB Contractor shall prepare an *Aesthetics and Landscaping Plan(s)* in conformance with the Project's final aesthetic Concept which provides guidelines and requirements for the aesthetics design of the Project. The final aesthetic concept is incorporated into the Aesthetics and Landscaping Plan and submitted for TxDOT review and approval within 120 days of issuance of NTP1.

The *Aesthetics and Landscaping Plan(s)* shall include all Elements to fully communicate the proposed aesthetic treatment to TxDOT and shall address:

- Aesthetics

DB Contractor shall provide:

a. All plans, sections, elevations, perspectives, isometrics, etc., as needed to fully communicate the aesthetic treatment and approach to aesthetic Elements including: walls, noise walls, bridges, traffic rail, and signage structures;
b. A master plan that will convey the layout of the various roadway conditions (i.e., depressed sections, elevated sections, at-grade roadways, bridges, cantilevered structural sections, etc.);
c. Drawings showing locations of site-specific Elements (i.e., fences, signage, colored lighting, potential locations of community improvement opportunity areas, gate way markers, bridge enhancements, landscaping);
d. Drawing showing the location of existing and proposed Utilities as they relate to the location of aesthetic improvements. DB Contractor shall provide composite drawings showing potential conflicts for proposed improvements; and
e. Drawings showing color schemes and their locations.

- Landscaping

DB Contractor shall provide:

a. A plan that indicates plant palettes, plant locations, plant specifications, planting specifications, and planting dates;
b. An establishment program;
c. A maintenance program;
d. A watering program; and
e. Composite drawings of all utilities and easements that would interfere with landscaping, markers, or any other identified enhancements.

The *Aesthetic and Landscaping Plan(s)* shall include all plans, elevations, perspectives, isometrics, etc., as needed to fully convey the aesthetic treatment.

Upon completion of the *Aesthetic and Landscaping Plan(s)*, DB Contractor shall consolidate the information, which establishes the requirements for engineering of the highway corridor aesthetics. The guidelines shall serve as the primary standard guidance necessary to produce the intended aesthetic form, function, and appearance of this and future similar projects.

This *Aesthetics and Landscaping Plan(s)* shall be presented in the following format:

a. 11x17 format
b. Front sided only
c. Eight (8) paper copies, in color
d. Eight (8) CD copies, with guidelines in portable document format (PDF)

The *Aesthetics and Landscaping Plan(s)* shall be incorporated into the final engineering design.

TxDOT approval of the *Aesthetics and Landscaping Plan(s)* is required prior to construction of any Elements affected by this Plan.

15.2.3 Personnel

DB Contractor shall provide a landscape architect, registered in the State of Texas, with a minimum five (5) years' experience in designing aesthetics and landscaping Elements for roadway projects of similar scope and size, to develop the *Aesthetics and Landscaping Plan(s)*. The Landscape Architect shall remain involved from the beginning of the *Aesthetics and Landscaping Plan*, through construction to ensure continuity and compliance with the *Green Ribbon Project Guidelines*.

15.3 Design Requirements

15.3.1 Aesthetics Principles and Strategies

DB Contractor shall follow the guidelines and requirements of the approved *Aesthetics and Landscaping Plan(s)*, 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 context and landscape to the fullest extent possible.
d. Simple geometric shapes for structures shall be used to the extent possible for continuity along the entire length of the Project.
e. All bridges and other structures shall be simplified in their design, and to the greatest extent possible kept small in size, bulk, and mass.
f. All structures shall be carefully detailed so as to achieve the greatest level of aesthetic quality and conform to the *Green Ribbon Project Guidelines* and approved Houston District Standards.
g. Color, texture, and form shall be used appropriately for all structures.
h. Graphics, signage, and lighting shall be consistent along the entire length of the Project.
i. Existing trees and natural features shall be preserved and/or replaced if disturbed to the greatest extent possible.
j. Aesthetics Elements shall be fully integrated with the overall landscape design.
k. Visual quality of the landscape shall be consistent along the entire length of the Project.
l. Native-area and/or naturalized plant materials that exhibit good drought tolerance shall be used to the extent possible.

m. Aesthetic Elements shall be easy to maintain and resistant to vandalism and graffiti.
n. Aesthetic Elements shall conform to the *Green Ribbon Project Guidelines*, and approved Houston District Standards.
o. Landscape shall be established and maintained.
p. Landscape shall be consistent with TxDOT *Houston District Planting Layout Guidelines*.

15.3.2 Walls

DB Contractor shall design noise/sound walls to be similar in color, texture, and style to those of retaining walls, and shall develop an aesthetics treatment that is consistent with the *Green Ribbon Project Guidelines* and approved Houston District Standards. DB Contractor shall apply aesthetic treatments to the vertical surfaces of retaining and noise/sound walls where the surface is visible from the roadway or adjacent houses. Consistent treatments shall be used for retaining and noise/sound walls that articulate the design themes established for the Project.

The roadside face of noise walls shall have a consistent appearance throughout their length. The side of the noise walls facing away from the roadway may vary based upon community input gathered by the DB Contractor.

For retaining walls at the intersections with SH 146, FM 565, and Langston Road in the City of Mont Belvieu, the first 100 feet from the end of the wall at or adjacent to the bridge abutment is to be flat blank panels.

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. All substructure columns shall be consistent in form and texture, with similar shapes and details used for all bridges, in accordance with the *Green Ribbon Project Guidelines* and approved Houston District Standards.

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 consisting entirely of steel girders or concrete beams. For superstructures where both steel girders and concrete beams are used, such as at direct connection structures and braided ramps, transition from concrete beams to steel girders may be accomplished by dapped end girders and concrete beam spans shall be of constant depth throughout the structure.

Low Visibility Bridges

Low visibility bridges do not require aesthetic treatments and can be designed and constructed using standard TxDOT bent caps, standard TxDOT round columns, standard TxDOT overhangs, standard TxDOT bridge rails and sloped concrete riprap at abutments.

Low visibility bridges are:

- Segment H – Mainlanes over White Oak Creek
- Segment H – Mainlanes over Caney Creek Tributary
- Segment H – Mainlanes over Caney Creek
- Segment H – Mainlanes over Church House Gully
- Segment H – EB and WB frontage roads over Church House Gully
- Segment H – Mainlanes over Cedar Bayou Tributary #1
- Segment H – Mainlanes over Cedar Bayou Tributary #2
- Segment H – Mainlanes over East Fork of Cedar Bayou

- Segment H – Mainlanes over ditch crossing #28 (Sta. 2132+95 to Sta. 2136+55)
- Segment H – Mainlanes over ditch crossing #60 (Sta. 2187+65 to Sta. 2187+87)
- Segment H – Mainlanes over unnamed canal (Sta. 2298+05 to Sta. 2299+10)
- Segment I-1 – Mainlanes over Dayton Canal
- Segment I-1 – West Prong of Old River
- Segment I-1 – Mainlanes over ditch crossing #40 (Sta. 2487+79 to Sta. 2488+99)
- Segment I-1 – Industrial Spur/UPRR/Lynchburg
- Segment I-2B – Mainlanes over Goose Lake (widening)

DB Contractor shall not use varying shaped columns within the Segments. All new columns shall have the same form in accordance with the *Green Ribbon Project Guidelines* and approved Houston District Standards throughout the segments as identified in Section 15.2.1.

The following requirements apply to bridge abutments:

1. On all bridges that have sloped abutments and are visible to traffic, DB Contractor shall not be allowed to wrap concrete rip rap around the bridge abutments. The concrete rip rap shall be limited to three feet past the limits of the bridge deck overhead. However, this requirement shall not be applicable to bridges spanning creeks.
2. DB Contractor shall provide the appearance of a symmetric design for bridges where possible.

15.3.4 Trees, Shrubs, and Other Plant Materials

All trees, shrubs, deciduous vines, and perennials shall comply with the applicable requirements of *ANSI Z60.1 American Standard for Nursery Stock*. DB Contractor shall consult with the TxDOT Houston District and Beaumont District Landscape Architect for recommended plant species lists. DB Contractor shall use plant species native to the area or naturalized for the Site.

In order to establish and maintain landscape planting, DB Contractor shall provide a watering program for a minimum of 24 months.

In order to promote rooting establishment, DB Contractor shall provide a soil preparation plan for entire landscape planting areas.

In order to monitor and control weeds, DB Contractor shall provide weed control measures in the *Aesthetics and Landscaping Plan*.

Vegetation provided as a part of DB Contractor's *Aesthetics and Landscaping Plan(s)*, other than grassing, and erosion control measures, shall be incorporated with the following guidelines:

- Plants shall be placed in accordance with TxDOT's minimum clearance zones. Trees shall conform to landscape development concepts, guidelines and principles set forth in the TxDOT *Houston District Planting Layout Guidelines*.
- Design must be in conformance with TxDOT *Houston District Planting Layout Guidelines*. These Guidelines support the *Green Ribbon Project Guidelines* goals of having trees planted along roadways wherever appropriate. The native naturalized reforestation design shown in the *Houston District Planting Layout Guidelines* is required because of visual considerations and long-term maintenance.

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, bent columns, retaining walls, freeway ramp gores, paved ditches, flumes, and ditch inlets to improve roadway appearance.

Concrete rip rap shall be applied per the *Green Ribbon Project Guidelines* and approved Houston District Standards.

15.3.6 Lighting

DB Contractor shall design the aesthetic enhancement lighting with the following aesthetic criteria:

- One pole type for the entire corridor. DB Contractor shall provide a lighting layout plan that addresses each light fixture (i.e. roadside lighting, high mast lighting, under bridge fixture, etc.) and type of light fixture (i.e. LED lighting, point source lighting, HID, etc.)

15.3.7 Color Palette

As part of the *Aesthetics and Landscaping Plan(s)*, DB Contractor shall conform to approved Houston District Standards.

15.4 Construction Requirements

DB Contractor shall provide TxDOT sample panels a minimum of 60 Days in advance of starting construction of textured concrete surfaces. DB Contractor shall construct sample panels in accordance with Item 427.4.B.2.d (Form Liner Finish) of TxDOT Standard Specifications that comply with the principles, requirements, and strategies established by TxDOT and the approved *Aesthetics and Landscaping Plan(s)* and approved Houston District Standards. TxDOT must review and approve the sample panels before any construction form liners may be ordered, obtained, or used. DB Contractor shall provide sample equivalent to the size of the panels that will be installed when constructed 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.

All sample panels shall be representative of the actual panel that will be placed. Primary, secondary and accent colors shall be displayed.

15.5 Aesthetic Enhancements

The 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 Aesthetic Concept* to be submitted in plan form to TxDOT for approval.

16 SIGNING, DELINEATION, PAVEMENT MARKING, SIGNALIZATION, AND LIGHTING

16.1 General Requirements

This Section 16 includes requirements with 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 local agencies 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 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 *Texas Manual on Uniform Traffic Control Devices* (TMUTCD) and TxDOT's *Standard Highway Sign Design for Texas* (SHSD), TxDOT's Traffic Engineering Standard Sheets and TxDOT Standard Specifications.

The DB Contractor shall design all illumination in accordance with the TxDOT's *Highway Illumination Manual* (HIM), National Electric Code (NEC), AASHTO *Roadway Lighting Design Guide*, TxDOT's Traffic Engineering Standard Sheets, and TxDOT specifications.

DB Contractor's design shall incorporate the following requirements:

- Minimum size for all proposed warning signs shall be 36"x36".
- Install warning signs W19-2 (48"x48") "WATCH FOR ICE ON BRIDGE" in advance of all bridges.
- Use R3-7R "RIGHT LANE MUST TURN RIGHT" and R3-7L "LEFT LANE MUST TURN LEFT" signs where required. Do not use R3-5R or R3-5L "Arrow and ONLY" signs.
- Install object markers OM-2Y under the route marker assembly located at the entrance ramp gore between the frontage road and mainlanes.
- Install object markers OM-1 on each leg of large ground mounted signs where the signposts are not protected by concrete barrier or metal beam guard fence, similar to the exit sign at the exit gore.
- Install appropriate added lane sign W4-3R/L (48"x48") or merge sign W4-1R/L (48"X48") on the mainlanes of the freeway in advance of each entrance ramp.
- Install advisory exit speed limit sign W13-2 (48"x60") on the mainlanes in advance of each exit ramp.
- Small roadside signs shall use a triangular slipbase system in accordance with TxDOT standard drawings "Sign Mounting Details Small Roadside Signs Triangular Slipbase System SMD(SLP-1) thru SMD(SLP-3)-08" and shall use an anchor type "SA".
- Design guide sign details according to the Standard Highway Sign Designs for TMUTCD and TxDOT standard drawings "Typical Sign Requirements", TSR (1)-08 through TSR (5)-08.

- Use the B-3 arrow for overhead guide sign panel at the exit ramps.
- Design all overhead sign structures for zone 1, 100 mph wind zone.
- All proposed signs installed on overhead sign structure facing same direction of traffic shall have the same height, except for supplemental overhead speed limit signs (which are 72”x90”).
- Center all proposed overhead sign panels on the overhead sign structure truss.
- The bottom of the proposed overhead sign panels facing the same direction of traffic shall be on the same horizontal plane.
- All the small signs shall be aluminum type A.
- Design all large ground mounted signs for zone 1 (Type 100) which is 90 mph wind zone. (See TxDOT drawing “Roadside Guide Sign Post Selection Worksheet-SMD (8W1)).
- All overhead sign panels shall be extruded aluminum.
- All large ground mounted signs shall be extruded aluminum.

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 schematic received with the Proposal. If a preliminary operational signing schematic does not exist, DB Contractor shall prepare and submit a preliminary operational signing schematic for review and approval by TxDOT and Federal Highway Administration (FHWA) prior to commencing Final Design. Before placing any signs, delineation, advance toll warning signs, third party signs, non-standard sign structures, pavement markings, traffic signals, 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 signs as shown on the Final 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 striping, 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 structures.

DB Contractor shall ensure that signs are clearly visible, provide clear direction and information for users, and comply with all applicable TMUTCD requirements.

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.

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 local or other State agencies. DB Contractor shall coordinate with appropriate Governmental Entities for the design and installation of such signs.

16.3.4 Advance Toll Information Signs

For advance toll information signs, DB Contractor shall be responsible for coordinating with TxDOT to accommodate sign locations and foundation types, and design and installation of the new signs. The DB Contractor shall prepare and submit a preliminary advance toll information signing schematic for review and approval by TxDOT no later than six months prior to the scheduled date for Substantial Completion.

DB Contractor shall coordinate with TxDOT and all local toll entities in the area in determining the locations for advance toll information signs. At a minimum, advance toll information signs shall be installed at the following locations:

- At all locations where an existing roadway provides public access to the Project
- Prior to all entrance ramps to the Project

16.3.5 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.

16.3.6 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 Section 13 (Structures) and Section 15 (Aesthetics and Landscaping).

DB Contractor shall design sign support structures to provide a vertical clearance of not less than 21 feet between the roadway and the bottom of the sign.

DB Contractor's design shall also incorporate the following requirements:

- All overhead sign structures towers shall be concrete with the standard truss as shown on standard sheets. Coordinate the overhead sign structure elevation details with the overhead sign structure concrete column design.
- All the overhead sign structure towers installed on bridge structures shall be steel pipe with the standard truss as shown on standard sheets.

16.3.7 Pavement Marking

DB Contractor shall ensure that the design and installation of all pavement markings comply with applicable TMUTCD requirements, TxDOT's Traffic Engineering Standard Sheets and Houston District 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 TxDOT's Traffic Engineering Standard Sheets.

DB Contractor shall use contrast markings for skip lines on the controlled access mainlanes where light-colored pavement does not provide sufficient contrast with the markings. Contrast markings consist of black background in combination with standard TMUTCD marking colors.

DB Contractor's design shall also incorporate the following requirements:

- Painted or thermoplastic longitudinal pavement markings shall not be used on mainlanes and frontage roads.
- All pavement markings on frontage roads and mainlanes shall be multipolymer pavement markings, except mainlane lane lines, words, symbols, and shields.
- Mainlane lane lines shall be 12" contrast prefabricated pavement markings with warranty (6" white with 3" black on each side).
- All word, symbol, and shield pavement markings shall be prefabricated pavement markings Type C.
- Frontage road lane line pavement markings shall be 6" multipolymer pavement markings with shadow.

- All edge lines on the mainlanes and frontage roads shall be 6" pavement markings.
- Paint all median noses and exclusive left turn lane curbs with reflective pavement markings (Type II).
- Pavement marking shields, cardinal direction (WEST, EAST, NORTH, SOUTH), and arrows shall be used on the mainlanes approaching major interchanges to identify exiting and through traffic lanes. Install these pavement markings within approximately one mile of the interchange.
- All signing and pavement markings at the exit ramps and frontage roads shall be according to Houston District Standards ER-FR (1)-09 or ER-FR (2)-09 if applicable. Exit gore pavement markings shall not require 12" diagonal pavement markings as shown on FPM (1)-12 through FPM (4)-12. Exit gore pavement markings on mainlanes shall include exit number gore markings that match the exit number as shown on standard PM (4)-12.

16.3.8 Signalization

Traffic signal designs and modifications to existing traffic signals shall be completed in accordance with TxDOT Standard Specifications, the TMUTCD, and the requirements of the appropriate Governmental Entity.

16.3.8.1 *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. 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.

DB Contractor shall provide interconnection systems between new or modified signals and any other signal system within the Site as required by TxDOT or the appropriate local 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 Site, and shall provide all communication hardware/equipment for TxDOT or the appropriate local Governmental Entity to communicate with the signal systems within the Site.

TxDOT authorized intersections requiring permanent traffic signals pending warrant studies are:

- US 59 NB Frontage Road
- FM 1485
- Galaxy Boulevard
- Huffman/Cleveland
- FM 686
- FM 1960
- US 90
- FM 1413
- SH 146
- FM 565
- I-10 WB Frontage Road
- Upgrade of Wyoming Street

New or modified traffic signal equipment shall conform to regional Intelligent Transportation System (ITS) architecture and existing interconnected traffic signal systems.

DB Contractor shall provide both pedestrian and vehicle detectors at all traffic signals within the Site and shall comply with TxDOT's *Accessible Pedestrian Signal (APS) Guidelines*.

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's design shall also incorporate the following requirements:

- Use Type D ground boxes.
- Traffic signal heads shall be black polycarbonate housing and with black backplates installed
- Vehicular signal indications shall be 12" LED.
- Pedestrian signal heads shall be LED and have countdown indications.
- Locate signal cabinets between the frontage roads between the columns of the mainlane overpass. Located on the CTMS-cabinet side, if present.
- Single left turn lane to have single 4-section signal head with "<R <R <Y <G" centered over left turn lane.
- Dual left turn lanes to have two 3-section signal heads with "<R <Y <G" centered over each left turn lane.
- Through signal heads are to be 3-section signal head closest to the stop bar of the one-way frontage R Y G" centered over each through lane for two through lanes and on the lane lines for three or more through lanes.
- For the cross street approaches, the 3-section signal closest to the stop bar of the one-way frontage road shall have an R6-1L (R) "one way" sign mounted beneath it.
- For dual left turn lanes on the cross streets, provide an R3-8 VAR lane assignment sign on the mast arm.
- Use loop detectors for vehicle detection.
- For electrical services greater than 300' in distance from the controller, provide a Type T service at the controller as an electrical service disconnect.
- Show luminaires on top of signal poles (two for each frontage road direction). Use LED luminaires.
- Use 1/C #4 XHHW for all power cable.
- Use 1/C #4 bare for grounding of all conduits containing power cable.
- Use 1/C #6 bare for grounding of all conduits containing non-power cable.
- Use 2/C #14 AWG Type C for all loop detector cable.
- Use 25 PAIR -#22 AWG for copper interconnect, where applicable.
- Use 12 STRAND (SM) for fiber interconnects, where applicable.
- Use Schedule 80 for all PVC conduits.
- Use rigid metal conduit between all ground boxes and signal/pedestal poles.
- Use rigid metal conduit between all ground boxes and controllers.
- Use rigid metal conduit between all ground boxes and electrical services.
- Minimum 3" conduit for bores or conduit beneath proposed pavement.
- Run power cable in separate conduit with separate ground boxes.
- Run signal cable in separate conduit.
- Run 4/C #12 TRAY cable for safety lighting in same conduit as signal cable.
- Illumination cable to bypass the controller.
- Use 2/C #12 AWG Type A for all pedestrian pushbutton cable.
- Use 4/C #12 AWG Type A for all pedestrian signal head cable.
- Use 7/C #12 AWG Type A for all traffic signal head cable.
- Install battery back-up system for signal cabinets.

16.3.8.2 *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.

16.3.8.3 *Traffic Signal Warrants*

As part of the Final Design process, DB Contractor shall collect traffic data and prepare traffic warrant studies for intersections not signalized at the time of NTP1 including those listed in Section 16.3.8.1 and shall submit these signal warrant studies to TxDOT for review. The warrant studies shall address all signal warrant criteria in the TMUTCD. DB Contractor shall make recommendations for new signal installations based on these warrant studies in consultation with TxDOT and the appropriate Governmental Entities. TxDOT will reasonably determine if a signal or modification is required, based upon the warrant study.

All requests for signals within the Project ROW throughout the Term of the Agreement shall be subject to TxDOT approval.

Signal warrant studies shall be based on actual traffic and/or opening year traffic projections. If actual traffic volumes are not available, but opening year traffic is 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 Design Year traffic projections. DB Contractor shall conduct additional traffic signal warrant studies for all intersections located in the Project ROW, commencing six months after the Project is opened for traffic. 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 traffic 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.

16.3.8.4 *Traffic Signal Support Structures*

DB Contractor shall coordinate with TxDOT and the appropriate Governmental Entities to determine the type of traffic signal support structures. DB Contractor shall obtain the maintaining Governmental Entities' approval of traffic signal support structures to be used on new signal installations.

Designs for traffic signal support structures shall also comply with requirements in Section 13 (Structures) and Section 15 (Aesthetics and Landscaping).

16.3.8.5 *Traffic Signal Systems*

DB Contractor shall provide interconnection systems between new or modified signals and any other signal system within one mile of the Site 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 Site, and shall provide all communication hardware/equipment for TxDOT or the appropriate Governmental Entity to communicate with the signal systems within the Site.

DB Contractor shall coordinate with TxDOT and the appropriate Governmental Entities to determine the type of traffic signal support structures. DB Contractor shall obtain the maintaining Governmental Entities' approval of traffic signal support structures to be used on new signal installations.

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. The DB Contractor shall conduct testing in accordance with the ATP and document those results to show conformance.

16.3.9 Lighting

DB Contractor shall prepare lighting studies that consider illumination levels, uniformity, and sources for the roadways, interchanges, and special areas. DB Contractor shall maintain an average horizontal luminance on the roadways as described below. DB Contractor shall submit a computer generated light level array for all lighted areas within the Project limits to TxDOT for review.

All third-party requests for lighting within the Site shall be subject to TxDOT approval.

High mast and conventional lighting shall meet the photometric level requirements as stated in TxDOT Standards (RID LUM)-07, (HMID 7)-03 and the AASHTO *Roadway Lighting Design Guide*.

DB Contractor shall design the lighting system to minimize or eliminate illumination of areas outside the Project ROW. DB Contractor shall design continuous and safety lighting systems in accordance with Chapters 2, 5, 6, 7, and 9 of the TxDOT Highway Illumination Manual. At all times during the Term of the Agreement, DB Contractor shall maintain safe lighting conditions along the Project roadway.

Additionally, DB Contractor shall provide conventional safety roadway lighting at all underpass and overpass locations and at all entrance and exit ramp gores within the Project limits.

Conventional 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 mast arms on traffic signal poles
- Placing pole bases on existing or proposed concrete traffic barrier
- Placing poles behind existing or proposed concrete traffic barrier or metal beam fence
- Placing high mast lighting outside the clear zone, especially in roadway horizontal curves

DB Contractor shall ensure that lighting structures comply with 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 provide to TxDOT, as part of the Final Design Documents, an Acceptance Test Plan (ATP) for all illumination. This ATP shall also be submitted to the appropriate Governmental Entity. The DB Contractor shall conduct testing in accordance with the ATP and document those results to show conformance.

16.3.9.1 *Additional Requirements*

Additional requirements are as follows:

a) High-mast lighting must not infringe into residential areas adjacent to the Project ROW.
b) DB Contractor must coordinate with the FAA regarding installation of obstruction lights, if any, on a case-by-case basis.
c) At a minimum, underground conduit in interchange areas or temporary detours shall not be less than 2" or Schedule 80 polyvinyl chloride (PVC); all other underground conduit installations shall not be less than 2" or Schedule 40 PVC.
d) The minimum conductor size shall be #8 AWG copper on roadway and #12 AWG on underpass lights. DB Contractor shall not use duct cable for illumination purposes.
e) DB Contractor shall place bridge lighting brackets no more than 10 feet from abutments or bents; however, in special circumstances, the bridge lighting brackets may be placed a maximum of 20 feet from abutments and piers.
f) Non-standard light pole design shall be submitted to TxDOT for approval. For light poles with a base 25' above the elevation of surrounding terrain, DB Contractor shall electronically submit design calculations and shop drawings to TxDOT, Bridge Division.
g) Minimum inside dimensions for ground boxes shall be 15.25 inches (width) by 28.25 inches (length) by 20 inches (depth).
h) Ground box covers shall be 2-inch-thick (nominal), non-conducting material and labeled "Danger High Voltage Illumination".
i) Riprap aprons shall be provided around all ground boxes.
j) 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.
k) Electrical part of the installation shall be designed and installed in conformance with the National Electrical Code (NEC), TxDOT Standards and Specifications.

16.3.10 Visual Quality

Notwithstanding the requirements of Section 16.3.8 (Signalization), 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, traffic signal systems, 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 TMUTCD Table 2A-3 (Minimum Maintained Retroreflectivity Levels).

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:

a) Type I, Thermoplastic, Pavement Markings:
   - White markings: 250 millicandelas per square meter per lux (mcd/m2/lx)
   - Yellow markings: 175 mcd/m2/lx

b) Type II, Paint & Beads, Pavement Markings:
   - White markings: 175 mcd/m2/lx
   - 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 stake each pole location in the field and provide TxDOT 72 hours' notice prior to installation of any foundation.

Separately metered electrical service shall be installed for permanent signals. When safety lighting is installed by the state in an incorporated city as part of a traffic signal installation, a separate electrical service is not required for this safety lighting. All other elements of the Work requiring electrical service shall be separately metered from the traffic signals

DB Contractor shall provide TxDOT with copies of all signal warrant studies as required in this Section 16. DB Contractor shall also provide copies of all final signal timing.

Before placing any permanent traffic signals, DB Contractor shall provide TxDOT a layout indicating the proposed location of such items.

16.4.4 Permanent Lighting

DB Contractor shall coordinate with the Utility Owner(s) and ensure power service is initiated and maintained for permanent lighting systems. Where the Work impacts existing lighting, DB Contractor shall maintain existing lighting as temporary lighting during construction and restore or replace prior to Substantial Completion of the Segment. 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. The identification decal shall denote a contact name, 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 to the people using the facility.

TxDOT is operating an ITS network that will need to connect to the new system provided by DB Contractor. The Project ITS must be compatible with such in-place system(s) that TxDOT and other agencies (including other DB Contractors) are currently operating. DB Contractor shall coordinate the ITS planning and implementation with TxDOT and other Governmental Entities that have roadways within or 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.

The Project ITS shall conform to the Houston-Galveston Regional ITS Architecture, conform with the Regional Data and Video Communications System (RDVCS) and have physical connections with the existing TxDOT ITS communications network on major freeways. The functionality of the ITS shall be such that command and control of appropriate field devices is shared and exchanged with appropriate Governmental Entities.

DB Contractor shall be responsible for the planning, design, installation, maintenance, and operation of safe and functional ITS for the Project. All components of the ITS shall conform to the provisions of the National Transportation Communication for ITS Protocol (NTCIP). DB Contractor shall maintain ITS interoperability over the Term of the Agreement with TxDOT's Houston TranStar Traffic Management Center (TMC) and other Governmental Entities. The ITS shall be coordinated with the Electronic Toll Collection System (ETCS) such that the communication requirements of the ETCS system are accommodated.

The Project ITS shall operate under the Houston-Galveston Regional ITS Architecture. Houston TranStar shall be the main TMC for this project. Communication and interoperability shall be achieved with other TMCs in the region, including Houston TranStar, such that with appropriate privileges, access to data, command, control and information sharing can occur among centers. 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 is expandable as capacity is increased along the Project roadways, utilizes hardware and software components consistent and compatible with TxDOT in the manner described in this Section 17.2 and the other affected Governmental Entities, resistant to weather encountered in the Project area, and places components in locations that are not hazardous to Users. DB Contractor shall prepare a preliminary ITS layout for review and concurrence by TxDOT to ensure adequate planning of the ITS implementation.

ITS backbone shall be a minimum of one, 144-strand single mode fiber optic cable. Subject to the specific requirements of this Section 17, DB Contractor shall determine the number and specific locations of all ITS components. Separately metered 120/240 volt single phase electrical services shall be installed for ITS installations.

DB Contractor shall provide safe ingress/egress areas and structures to accommodate authorized personnel access to ITS components for maintenance and operation activities.

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 version of TxDOT's LoneStar Software that is operational at Houston TranStar.

All ITS devices and associated mountings shall meet the 100 mph wind load design standards.

The installed ITS Equipment shall provide TxDOT access to accurate and reliable data and quality video images and accurate control of field devices from Houston TranStar on a real-time basis 24 hours a day, 7 days a week. Real-time is defined as correct data being available at Houston TranStar within thirty (30) seconds of being processed or the correct response of a field component within one (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 TxDOT statewide and/or Houston District Standards as well as any standard publications provided by TxDOT at the time of actual design work.

The design and construction requirements, together with the design criteria presented in the TxDOT statewide and/or Houston District Standards 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. The DB Contractor may supplement these requirements in order to access the data and video images and control of the CCTV for the sole purpose of managing the Project. As between the parties, TxDOT shall retain ownership and all rights to the data and video images and the DB Contractor shall not provide access to the data or video images to any third party without the authorization of TxDOT's representative.

DB Contractor shall be responsible for the installation and access to power required to operate the ITS devices including all utility costs until Substantial Completion of the Segment and Final Acceptance by TxDOT.

17.2.1 ITS Communications Requirements

DB Contractor shall provide a communications network that serves the highway ITS and tolling components of the Project. Communications network shall be compatible with recently installed tolling equipment in Segment I-2A. Where necessary, as determined by TxDOT, DB Contractor shall provide communication node buildings and cabinets to support the communications network.

The current TxDOT communications network backbone is a 10 Gigabit Multiple Protocol Label Switching (MPLS) Ethernet network.

17.2.2 Conduit

DB Contractor shall determine 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 network and operations.

Conduit shall be 3" in diameter. The conduit shall support a minimum of 144-strand fiber optic cable and be in a different duct bank than conduit for tolling elements. ITS conduit backbone must be encased as per TxDOT standard drawing, "ITS Conduit Trench Details", ITS(27)-16.

DB Contractor shall repair each communication cable or electrical conductor that is severed or otherwise rendered not usable.

The DB Contractor shall provide materials and use construction methodology in conformance at a minimum with the applicable TxDOT Standard Specifications.

17.2.3 CCTV Cameras

DB Contractor shall install and ensure functionality of CCTV cameras for Incident verification, and traffic management. 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.

17.2.3.1 *Equipment*

DB Contractor shall install and ensure functionality of necessary CCTV equipment, including cameras, camera controls, cables, and connections. DB Contractor shall provide all the equipment necessary for TxDOT secondary control of all CCTV cameras.

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 TxDOT at Houston TranStar, and if necessary convertible for use by TxDOT's in-place ITS network.

17.2.3.2 *Placement*

CCTV cameras shall be provided and placed by the DB Contractor to enable TxDOT to monitor traffic conditions on highway lanes, frontage roads, 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 unless otherwise approved by TxDOT.

The DB Contractor shall utilize multiple CCTV camera installations at multi-level interchanges to ensure complete visual coverage of the interchange.

Distance between CCTV cameras shall not exceed 1.0 miles.

17.2.3.3 *Video Requirements*

DB Contractor shall provide state-of-the-art CCTV cameras that meet the requirements of the applicable TxDOT statewide or TxDOT Beaumont/Houston District Standards. At any time prior to Final Acceptance, if any CCTV cameras fail to meet the latest TxDOT statewide or TxDOT Houston District Standards at the time of design, DB Contractor shall replace such cameras within 48 hours of discovery of lack of compliance.

17.2.3.4 *Operating Requirements*

DB Contractor shall provide cameras with built-in heaters, mounting structure, and related equipment capable of operating within the following weather conditions:

a. Wind load of 100 mph without permanent damage to mechanical and electrical equipment
b. Ambient temperature range of -35 degrees Fahrenheit to +140 degrees Fahrenheit
c. Relative humidity range not to exceed 95 percent within the temperature range of +40 degrees Fahrenheit to +110 degrees Fahrenheit
d. Humidity range of 0 to 100 percent condensing

17.2.3.5 *Control Requirements*

DB Contractor shall supply CCTV equipment on this project which is fully compatible with the existing CCTV control system operated from Houston TranStar. DB Contractor shall deliver one complete set of CCTV equipment to Houston TranStar for testing by Houston TranStar IT personnel as part of the equipment submittal and approval process. Allow a minimum of 30 days for testing by Houston TranStar IT personnel. Submit the CCTV equipment for testing no later than 60 days after completion of TxDOT

submittal review. The equipment submitted for testing must be fully assembled and in a fully operational condition. Configure all equipment submitted for testing as is intended for use on the Project. Prototype equipment will not be allowed. The equipment will be interconnected to the existing CCTV control system and must be fully operational using that system. No modifications to the existing CCTV control system will be made to accommodate the submitted CCTV equipment. To be considered fully operational, at a minimum, the equipment must correctly respond to the following commands:

pan left	focus far
pan right	iris override
tilt up	iris open
tilt down	iris close
zoom in	Camera power (latching)
Zoom out	pan tilt position preset
Focus near	

Upon completion of installation, test the communications link installed between the communications hub building and the CCTV field equipment locations. Perform the test at all CCTV locations on the Project.

Use a test signal generator and a video monitor to demonstrate the ability of the video signal link to transmit a NTSC compliant video signal from the CCTV cabinet to the communications hub building. After completion of testing with the signal generator, connect the CCTV camera to the link and use a video monitor at the communications hub building to verify the presence of an NTSC compliant video signal. No degradation of the video signal must be discernible using the video monitor.

Connect a laptop computer containing TxDOT-supplied CCTV control software on the link and used to control the CCTV movement and control functions from the communications hub building utilizing the data link. Demonstrate the ability to control all CCTV functions outlined in the specifications.

Supply all test equipment, cabling and connectors necessary for performing the tests by the Contractor.

The equipment must be fully operational using the existing control system from Houston Transtar. Equipment which in any manner is not fully operational with the control system will be considered as not passing the test. Equipment which does not pass the test will be allowed one chance to be retested. The retest must occur within 30 days after the initial test. All issues of non-compliance and all discrepancies must be resolved for the second test. Equipment which is not able to be retested within 30 days or which does not pass the second test will be rejected and cannot be used on the Project. No additional time or compensation will be granted for the testing of the CCTV equipment. Successful testing of the CCTV equipment must be completed prior to any construction activities at the CCTV locations. No camera poles, cabinets or any other CCTV related equipment shall be installed until successful CCTV equipment testing has occurred.

17.2.4 Vehicle Detection

DB Contractor shall provide permanent detection in each highway lane of the Project that measures vehicle classification, vehicular volume, lane occupancy, and speed information on the roadway. The detectors shall be non-intrusive to the roadway Users. Spacing for the permanent vehicle detection shall be no greater than one mile in each highway lane in the Project or, at a minimum, provide detection for all highway lanes at one location between interchanges, each entrance ramp lane, and each exit ramp lane.

Vehicle detection sensors shall determine vehicle speed for each vehicle passing the sensor. DB Contractor shall provide upon TxDOT request, the raw speed data (volume and speed) for each vehicle detection sensor.

DB Contractor shall also install Bluetooth readers every two miles and/or at locations approved by TxDOT. These readers will be used to determine average segment speeds and travel times. The Bluetooth readers must be compatible with existing systems at Houston TranStar.

DB Contractor may attach detection units to existing structures with prior concurrence from TxDOT. Where an existing structure is not available, or in lieu of attaching the detection unit to an existing structure, DB Contractor shall install a mounting pole solely for the vehicle detector. Any mounting poles placed specifically for ITS items shall conform to TxDOT specifications for CCTV mounting poles.

17.2.5 Dynamic Message Signs (DMS)

DB Contractor shall provide a comprehensive network of electronic DMS using only light-emitting diode (LED) display technology.

DB Contractor shall position each DMS to allow motorists to safely view the messages being displayed. DB Contractor shall locate the DMS to comply with large guide sign spacing stated in the TMUTCD.

DMS shall conform to the TxDOT special specification National Transportation Communications for ITS Protocol for Dynamic Message Signs and shall demonstrate compliance before installation of DMS.

DMS shall be used to inform motorist of the availability of alternate routes, and to advise travelers of adverse road conditions and congestion. DMS shall be placed to provide a driver-friendly sign-viewing angle at each DMS location.

Location and placement shall be approved by TxDOT. A DMS shall also be placed at one (1.0) mile before the approach prior to any mainlane tolling facility. DMS shall have the ability to be controlled using the latest TxDOT's DMS operating system being used at Houston TranStar.

DMS shall be mounted using a T-mount and located so that mainlane closures are not needed to maintain the sign.

17.2.6 Lane Control Signals (LCS)

No LCS required.

17.2.7 Single-Line DMS (SDMS)

No SDMS required.

17.2.8 Communication Hub Enclosures/Communication Cabinets

DB Contractor shall coordinate with TxDOT the connection of all new ITS components to the existing ITS communication hub enclosures and communication cabinets covering the Project.

17.3 Construction Requirements

17.3.1 General

DB Contractor shall notify TxDOT thirty (30) days in advance of making connections to the existing TxDOT system.

DB Contractor shall maintain existing ITS communications functionality during construction activities.

DB Contractor shall coordinate with Utility Owner(s) and ensure that power service is available for permanent ITS systems.

17.3.2 Salvaging Existing Items

DB Contractor shall salvage all existing ITS equipment removed during construction of the Project, deliver to the TxDOT Houston District Headquarters, and stockpile as requested by TxDOT, all in an undamaged condition.

17.3.3 Existing ITS Relocation

DB Contractor shall relocate any existing ITS components, including hubs, satellite buildings, CCTV cameras, DMSs, detection devices, and fiber-links, as required to continue service from the existing components. DB Contractor shall sequence construction and relocation of existing ITS components, facilities, and systems to prevent lapses in TxDOT's receipt of video or data within the Project area. The existing physical links and the proposed physical links shall be in separate physical conduits.

Before removing existing ITS items and before beginning construction of segments without existing ITS, DB Contractor shall perform all activities necessary to maintain system operations during construction, including installing new ITS items, relocating or replacing existing ITS items, and connecting such ITS items to the existing network

18 TRAFFIC CONTROL

18.1 General Requirements

DB Contractor shall design, construct, operate and maintain the Project, in conformance with the requirements stated in this Section 18, 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 Governmental Entities on the development of the Traffic Control Plan (TCP).

It shall be the responsibility of the 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 Intelligent Transportation System (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:

a. Descriptions of the qualifications and duties of the traffic engineering manager, traffic control coordinator, and other personnel with traffic control responsibilities
b. Procedures to identify and incorporate the needs of transit operators, Utility Owners, Governmental Entities, local governmental agencies, Emergency Service providers, school districts, business owners, and other related Users, Customer Groups or entities in the Project corridor and surrounding affected areas
c. Procedures for obtaining acceptance of detours, road and Lane Closures and other traffic pattern modifications from applicable Governmental Entities, and implementing and maintaining those modifications
d. Procedures for signing transitions during construction from one stage to the next and from interim to permanent signing
e. Procedures for maintenance and replacement of traffic control devices, including pavement markings and traffic barriers, if used
f. 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
g. 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
h. Procedures and process for the safe ingress and egress of construction vehicles in the work zone
i. Provisions to provide continuous access to established truck routes and Hazardous Material routes, and to provide suitable detour routes, including obtaining any approvals required by the appropriate Governmental Entities for these uses
j. 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

k. 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
l. Descriptions of contact methods, personnel available, and response times for any deficiencies or Emergency conditions requiring attention during off-hours
m. Procedures for Off-Peak Period (weeknights) Work to include a work zone light system design in accordance with NCHRP Report 498 – *Illumination Guidelines for Nighttime Highway Work*
n. 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, the DB Contractor shall coordinate and utilize Dynamic Message Signs on the regional ITS system
o. DB Contractor shall utilize uniformed police officers contracted with TxDOT to effect Lane Closures. DB Contractor shall notify TxDOT four days in advance of the need for uniformed officers to enable TxDOT to schedule the uniformed officers. DB Contractor shall be responsible for the costs associated with the use of uniformed officers

The TMP must be approved by TxDOT prior to NTP2. 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.

18.3 Design Requirements

18.3.1 Traffic Control Plans

DB Contractor shall use the procedures in the TMP, TxDOT standard drawings, and TMUTCD requirements to develop detailed TCPs which provide for all construction stages and phasing, as well as all required switching procedures.

DB Contractor shall produce a TCP 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 local entities to implement the plans.

DB Contractor shall provide TxDOT with a TCP concept presentation for approval at or near 30% design status but prior to TCP plan sheet development. The DB Contractor shall utilize PowerPoint and roll plots to convey this concept at a TCP concept presentation meeting.

Each traffic control plan shall be submitted to TxDOT for review a minimum of 21 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).

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 coordination 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.

18.3.2 Design Parameters for Traffic Control Plans

Design Vehicle. Turning movement on all local streets and driveways shall, at a minimum, provide similar characteristics as existing.

Design Speed. On Interstate and State Highways, the design speed shall be 55 miles per hour (mph) or greater, except for major alignment transitions, where the design speed may be reduced to 45 mph if approved by TxDOT in its sole discretion.

Number of Lanes. The minimum number of lanes to be maintained shall be the number of lanes currently available on each facility. 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 mainlanes, frontage roads and major crossing streets is 11 feet. For minor crossing streets, TxDOT may, in its sole discretion, allow 10' lanes in limited circumstances during construction for short distances after reviewing the DB Contractor's traffic control plan.

Shoulders. A minimum one foot offset from the edge of travel way to the edge of pavement or traffic barrier is required.

18.3.3 Allowable Lane and Roadway Closures

Closures will only be permitted when the 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.

Lane Closures

DB Contractor shall not reduce the number of roadway controlled access lanes below the current number of roadway controlled access lanes during the Peak Period as described in Exhibit 1 of the Agreement. DB Contractor may reduce the number of roadway lanes in each direction during the Off-Peak Period, as described in Exhibit 1 of the Agreement, provided that a minimum of two roadway controlled access lanes in each direction are maintained.

If reasonable mobility can be maintained, or exceptional circumstances exist, additional lanes may be closed during the Off-Peak Period with the written permission of TxDOT. Off-Peak Hours may be started earlier or extended later with TxDOT approval if reasonable mobility can be maintained.

DB Contractor shall seek TxDOT approval if a reduction in the current number of frontage road or arterial street lanes are required.

If bridge demolition or beam erection cannot be accomplished safely within these requirements, DB Contractor may utilize weekend road closures between 9:00 pm Friday and 6:00 am Monday. DB Contractor shall seek TxDOT's approval for such traffic closures and shall provide a minimum of two weeks' notice of such closures. Any complete roadway closure shall occur during the Off-Peak Period and shall require the DB Contractor to develop a Traffic Control Plan with detours to be submitted and approved by TxDOT.

When Lane Closures are necessary, DB Contractor shall use the public information and communication methods available to inform the appropriate Customer Groups (refer to Section 3).

Lane Closures must be coordinated with adjacent projects.

Except for Incidents or Emergencies, DB Contractor may reduce the number of mainlanes in accordance with Table 18-1 (Permitted Lane Closures) during non-restricted hours in accordance with Section 18.3.4. DB Contractor shall pay Lane Rental Fees as specified in Exhibit 17 of the Development Agreement for Lane Closures other than those permitted in Table 18-1 until Final Acceptance and thereafter during the Warranty Term as defined in Section 11.1.2 of the Development Agreement.

Table 18-1: Permitted Lane Closures

Description of Operations		**Permitted Lane Closures[1]** (For all mainlane facilities other than the tolled mainlanes)	
Category of Work	**Roadway Lanes** (One Direction)	**Peak Period[2]**	**Off Peak Period[3]**
Placement of CTB, Placement of Pavement Markings, Full Depth Roadway Repair, Placement of Bridge Beams, Bridge Demolition or Similar Operations	5	None	3
	4	None	2
	3	None	1
	2	None	None
Adjacent Construction, Lanes for Construction Traffic or Similar Operations	5	None	2
	4	None	2
	3	None	1
	2	None	None

Notes:
1. A minimum of 2 lanes in each direction shall be required at all times except as specifically approved by TxDOT.
2. **Peak Period** means the period as described in Exhibit 1 of the Agreement.
3. **Off-Peak Period** means the periods as described in Exhibit 1 of the Agreement.

* Times shall be established utilizing 7 day-24 hour traffic counts to be performed by the DB Contractor, results of which shall be provided to TxDOT for evaluation. Peak Period hours shall be evaluated on an annual basis and the shall be adjusted as necessary.

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 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.

Ramp Closures

No two adjacent ramp closures may occur at the same time.

Failure to meet the minimum requirements for permitted Lane Closures as set forth in Table 18-1 will result in the assessment of Liquidated Damages as prescribed in Exhibit 17 of the Agreement.

Detour Usage

DB Contractor shall use State routes for detour routes, wherever applicable. If State routes are unavailable, DB Contractor shall use local arterials, provided that DB Contractor has obtained the necessary permits from the Governmental Entity having jurisdiction.

DB Contractor shall provide motorists with guidance on diverting 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 to divert traffic around the Project. Motorist guidance to and along detour routes shall be provided, together with regional guidance.

18.3.4 Restrictions on Lane and Roadway Closures

18.3.4.1 *Holiday Restrictions*

No Lane Closure that restricts or interferes with traffic shall be allowed from noon on the day preceding to 10:00 pm on the day after the following holiday schedule. TxDOT has the right to lengthen, shorten, or otherwise modify these restrictions as actual traffic conditions may warrant.

a) New Year's Eve and New Year's Day (December 31 through January 1)
b) Easter Holiday Weekend (Friday through Sunday)
c) Memorial Day Weekend (Friday through Monday)
d) Independence Day (July 3 through noon on July 5)
e) Labor Day Weekend (Friday through Monday)
f) Thanksgiving Holiday (Wednesday through Sunday)
g) Christmas Holiday (December 23 through December 26)
h) Spring break week (Saturday through the following Sunday)
i) Tax-free shopping weekend (Saturday and Sunday)

18.3.4.2 *Event Restrictions*

DB Contractor shall coordinate with TxDOT regarding Lane Closures during regional events. TxDOT has the right to lengthen, shorten, or otherwise modify these restrictions 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.

18.3.4.3 *Crossing Street Restrictions*

Major crossing streets must remain open to traffic at all times prior to Final Acceptance. When minor crossing streets are closed, adjacent major crossing streets must have a minimum of two lanes in each direction. Below is a list of major crossing streets for the Project:

a) I-69/US 59 Mainlanes
b) I-69/US 59 frontage roads
c) FM 1960
d) US 90
e) SH 146
f) I-10 Mainlanes
g) I-10 frontage roads

Minor crossing streets may be closed for bridge construction if adjacent cross streets are open to traffic and continuous frontage roads are open. Coordinate with the TxDOT for all minor street identification.

Any complete roadway closure shall require a traffic control plan to be submitted and approved by TxDOT and Governmental Entities having jurisdiction of roadways affected by the closure. Availability of frontage roads, ramp locations and detour distances shall be considered in the design. Complete mainlane closure may only be allowed during Off-Peak Periods (weeknights).

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, including a backup coordinator in the event the primary coordinator is unavailable, and the phone number(s) where they can be reached 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 the frontage roads and across all cross streets. Access to existing transit stop locations shall be maintained during construction or reasonable alternative locations shall be provided.

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 use State routes for detour routes, wherever applicable. If State routes are unavailable, DB Contractor shall use local arterials, provided that DB Contractor has obtained the necessary permits from the Governmental Entity having jurisdiction.

DB Contractor shall provide motorists with guidance on diverting 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 to divert traffic around the Project. Motorist guidance to and along detour routes shall be provided, together with regional guidance.

18.4.4 Local Approvals

DB Contractor shall communicate any ramp closure and staging analysis with the Governmental Entity having jurisdiction within the Project. When ramp movements are diverted or detoured along existing roads, DB Contractor shall be responsible for any and all user costs that may be assessed for the use of these existing roads. This may include traffic operation analysis, temporary traffic control devices, and road user costs, all payable to the local road authority. DB Contractor shall be responsible for obtaining the necessary approvals from agencies having jurisdiction over the routes used.

18.4.5 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.

18.4.6 Reinstatement of Utility Cuts

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

18.4.7 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

18.4.8 Final Clean-Up

DB Contractor shall clear and remove from the site all surplus and discarded materials and debris of every kind and leave the entire Project in a smooth and neat condition, after any construction process.

18.4.9 Stockpiles

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. All material stockpiles shall not be located within the clear zone of any traveled lane, unless positive protection is provided.

19 MAINTENANCE

19.1 General Requirements

DB Contractor shall operate and maintain the Project in a manner that provides a safe and reliable transportation system for improved mobility in accordance with this Section 19 from NTP2 through Substantial Completion.

19.1.1 General Maintenance Obligations

DB Contractor shall take all necessary actions to achieve the following:

a. Coordinate activities of other entities with interests or activities within the O&M Limits
b. Conduct daily patrols of all lanes of the Project within the O&M Limits to identify conditions that are unsafe or have the potential to become unsafe, conditions that could threaten the infrastructure, and to attend to existing or changing conditions
c. Minimize delay and inconvenience to Users and, to the extent DB Contractor is able to control, users of related transportation facilities
d. Incident response, management and reporting
e. Identify and correct all Defects and damages from Incidents
f. Monitor and observe weather and weather forecasts to proactively deploy resources to minimize delays and safety hazards due to high winds, severe thunderstorms, tornadoes, heavy rainfall and flooding, hail, snow, ice, or other severe weather events
g. Remove debris, including litter, graffiti, animals, and abandoned vehicles or equipment from the Project ROW
h. Minimize the risk of damage, disturbance, or destruction of third-party property during the performance of O&M Work
i. 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
j. Perform O&M Work including inspections, Incident response, traffic control, and routine operations and maintenance in accordance with the provisions of DB Contractor's Maintenance Management Plan (MMP) and the Contract Documents
k. Prompt investigation of reports or complaints received from all sources

19.1.2 Maintenance Manager

DB Contractor's Maintenance Manager shall be responsible for overseeing the performance of the O&M Work in accordance with the Technical Provisions including ensuring maintenance personnel and resources are available and properly trained for conducting O&M Work.

The Maintenance Manager shall be responsible for the health and safety of personnel involved with O&M Work and the general public affected by the Project and shall serve as the point of contact for the DB Contractor in communication with TxDOT and in coordinating activities with other entities during Emergency events.

19.2 O&M Limits

The initial O&M Limits are provided in Attachment 19-2. The O&M Limits shall include all Elements in Segment H and Segment I-1 except as noted in Attachment 19-2, and any Elements constructed or modified by DB Contractor in Segment I-2A (I-10 southward to east of FM 1405) and Segment I-2B (east of FM 1405 westward to SH 146). DB Contractor shall prepare and submit updated O&M Limits consistent with the DB Contractor's Final Design in the MMP. Within the O&M Limits, DB Contractor shall allow adjacent landowners to cross under bridges at breaks in control of access.

19.3 Scope of O&M Work

The responsibility for operation and maintenance for DB Contractor and TxDOT is established in Table 19-1 and the O&M Limits. For the avoidance of doubt, "existing" means Elements in place or operating prior to the Proposal Due Date.

When TxDOT is responsible for operations and maintenance, it will reasonably perform routine operation and maintenance of each Element which is normally included as an annually recurring cost in the TxDOT highway maintenance and repair budgets including repairs required to restore the asset condition following accidents and Incidents. TxDOT is not obligated to extend the residual life of any Element through reconstruction, rehabilitation, restoration, renewal, or replacement.

DB Contractor shall coordinate with TxDOT to achieve a smooth transition of maintenance activities from TxDOT between NTP1 and NTP2.

Table 19-1: O&M Responsibility

Segment	Responsibility	Scope	Duration
Segment H Segment I-1	TxDOT	existing Elements	NTP1 to NTP2
	DB Contractor	existing Elements and Elements constructed or modified by DB Contractor as depicted in Attachment 19-2	NTP2 to Substantial Completion
Segment I-2A Segment I-2B	TxDOT	existing Elements and Elements constructed or modified by TxDOT	NTP1 to Substantial Completion
	DB Contractor	Elements constructed or modified by DB Contractor as depicted in Attachment 19-2	NTP2 to Substantial Completion

19.4 Performance Requirements

19.4.1 Performance and Measurement Table During Construction

DB Contractor's performance of the O&M Work shall be governed by the Performance and Measurment Table During Construction as may be updated in accordance with this Section 19.4.1. For each measurement record DB Contractor is required to achieve the stated Target, otherwise a Defect exists that shall be remedied or repaired as further described in Section 19.4.2.

TxDOT may, at any time, require DB Contractor to adopt amendments to the columns with the headings "Measurement Record" and "Inspection and Measurement Method" in the Performance and Measurement Table During Construction where such updates are required to comply with Good Industry Practice and this Section 19. DB Contractor shall propose for TxDOT's approval any amendments to the "Inspection and Measurement Method" and "Measurement Record" as are necessary to cause these to comply with Good Industry Practice and the Technical Provisions in its annual Submittals of the MMP. TxDOT shall require the adoption of a new Target only when this is required because the "Inspection and Measurement Method" or "Measurement Record" no longer complies with Good Industry Practice. In this case, the new Target shall be determined using the principle that it shall achieve no less than the standard of maintenance that would have been achieved through DB Contractor's compliance with the original "Inspection and Measurement Method", "Measurement Record", and Target.

19.4.2 Defect Categorization

DB Contractor is responsible for performing all activities necessary to satisfy the performance requirements as shown in the Performance and Measurement Table During Construction. Failure to meet a performance requirement, whether through failure to meet the Target for any relevant measurement record, or for any other reason, shall be deemed to be a Defect. Whenever a Defect is identified, either by

DB Contractor's inspections, by TxDOT or any third party, DB Contractor shall create within the Maintenance Management System (MMS) a maintenance record containing details of the associated Maintenance Element, the nature and categorization of the Defect and the proposed timing and details of hazard mitigation, permanent remedy and permanent repair of the Defect and take immediate steps to alert Users to the hazard and shall categorize, correct, make safe and repair the Defect in accordance with the Performance and Measurement Table During Construction.

For each Defect identified, DB Contractor shall make a determination as to whether:

a. it represents an immediate or imminent health or safety hazard to Users or road workers,
b. there is a risk of immediate or imminent structural failure or deterioration,
c. there is an immediate or imminent risk of damage to a third party's property, or
d. there is an immediate or imminent risk of damage to the environment.

If a Defect meets any of the above criteria, DB Contractor shall record it as a Category 1 Defect and take all necessary action to mitigate and remedy the Defect. Any other Defect not meeting the foregoing criteria shall be assigned as a Category 2 Defect. DB Contractor shall take necessary action to avoid any Category 2 Defect from becoming a Category 1 Defect. DB Contractor shall monitor Category 2 Defects to verify the condition of the affected maintained Element prior to repair and shall inform TxDOT immediately if any such Defect deteriorates to a Category 1 Defect. Whenever TxDOT notifies the DB Contractor of any Defect that shall be categorized as a Category 1 Defect, DB Contractor shall mitigate the hazard and remedy within the applicable Defect Remedy Period. DB Contractor shall provide training to all relevant personnel on the categorization of Defects. DB Contractor shall maintain a record of the circumstances of the Defect and how it was categorized.

For Category 1 Defects, DB Contractor shall:

a. Take necessary action such that the hazard to Users is mitigated within the period given in the column entitled "Cat 1 Hazard Mitigation" in the Performance and Measurement Table During Construction.
b. Permanently remedy the Defect within the period given in the column entitled "Cat 1 Permanent Remedy" in the Performance and Measurement Table During Construction. "Cat 1 Hazard Mitigation" shall continue until a "Cat 1 Permanent Remedy" is completed.

For Category 2 Defects, DB Contractor shall undertake the permanent repair within the period specified in the column entitled "Cat 2 Permanent Repair" in the Performance and Measurement Table During Construction unless an earlier repair is required to prevent deterioration to a Category 1 Defect.

Where multiple instances of Defects arise from the failure to meet a given Target, a separate Defect shall be recorded for each Performance Section within which the Target is not met.

The remedy or repair of any maintained Element shall meet the Target in the Performance and Measurement Table During Construction. Where action is taken to remedy or repair any Defect in any maintained Element, DB Contractor shall create a maintenance record that identifies the nature of the remedy or repair. DB Contractor shall include within the relevant maintenance record a measurement record compliant with the requirements set forth in the column entitled "Measurement Record" in the Performance and Measurement Table During Construction.

The Defect Remedy Period set forth in the Performance and Measurement Table During Construction shall commence upon the earlier of: (i) the date and time DB Contractor became aware of the Defect; and (ii) the date and time DB Contractor should have known of the Defect.

19.5 Inspections

DB Contractor shall establish inspection procedures and frequency as well as a plan to implement a program of inspections necessary for the O&M Work. Inspection procedures shall ensure:

a. The Project is safe for Users.
b. Category 1 Defects are identified and repaired such that the hazard to Users is mitigated within the period given in the column entitled "Cat. 1 Hazard Mitigation" in the Performance and Measurement Table During Construction.
c. Category 1 Defects are identified and permanently remedied within the period given in the column entitled "Cat. 1 Permanent Remedy" in the Performance and Measurement Table During Construction.
d. Category 2 Defects are identified and permanently repaired within the period given in the column entitled "Cat. 2 Permanent Repair" in the Performance and Measurement Table During Construction.

In performing inspections to identify Category 1 Defects and Category 2 Defects, DB Contractor shall, for any maintained Element, conform at a minimum to the inspection standards set forth for that maintained Element in the column entitled "Inspection and Measurement Method" in the Performance and Measurement Table During Construction. DB Contractor shall employ only trained personnel for the purpose of such inspections, capable of accurately identifying, categorizing and recording Defects in accordance with the requirements of Section 19.4.2.

DB Contractor shall perform general inspections in accordance with the MMP so that the repairs of all Defects are included in planned programs of work.

DB Contractor shall record details of the manner of inspection (e.g. center Lane Closure or shoulder), the weather conditions, and any other unusual features of the inspection on inspection records in respect of general inspections.

DB Contractor shall submit to TxDOT non-conformance reports within seven Days of issuance and shall notify TxDOT of Nonconforming Work within two Days of discovering the Nonconforming Work. TxDOT will issue a non-conformance report if TxDOT discovers any Nonconforming Work. DB Contractor's responsibility to correct Nonconforming Work is set forth in Section 5.6 of the Agreement.

19.5.1 Performance Sections

As part of the MMP, DB Contractor shall prepare drawings identifying the Performance Sections and shall submit and update these plans with the applicable part of the MMP. The drawings shall identify the boundaries of each Performance Section and shall cross reference to an inventory describing each Element of the Project contained within each Performance Section.

DB Contractor shall implement the Texas Reference Marker (TRM) System used by TxDOT to establish Performance Sections for inspection and maintenance records in accordance with the MMP. DB Contractor shall use the existing TRM System established on existing sections of the Project. DB Contractor shall coordinate with TxDOT to establish the TRM System on newly constructed sections of roadway.

19.5.2 Routine Biennial Inspections of Structures

TxDOT will conduct routine biennial inspections, to the extent required, for all structures within the O&M Limits in compliance with the latest FHWA / NBIS and TxDOT requirements. The results of all routine biennial inspections will be made available to DB Contractor upon their completion.

Using the results of the routine biennial inspections, DB Contractor shall determine the condition of all Elements of the structures within the O&M Limits and shall identify Defects and enter these Defects in the MMS with the appropriate remedy or repair and Defect Remedy Period.

19.6 Maintenance Management Plan

DB Contractor shall prepare a MMP that is consistent with the general maintenance obligations described in Section 19.1.1 which includes procedures for managing records of inspection and maintenance activities, including appropriate measures that defines the process and procedures for the O&M Work. DB Contractor shall submit the MMP to TxDOT for review and approval within 30 Days after issuance of NTP1. DB Contractor shall update the MMP as required, or at least annually no later than 30 days prior to each anniversary of NTP2.

For each physical Element of the Project in accordance with the Performance and Measurement Table During Construction, including impacts to adjacent facilities, the MMP shall include:

a. performance requirements,
b. measurement procedures,
c. threshold values at which maintenance is required,
d. inspection procedures and frequencies, and
e. subsequent maintenance to address noted deficiencies.

The MMP shall identify response times to mitigate hazards, permanently remedy, and permanently repair Defects. Response times shall be in accordance with the Performance and Measurement Table During Construction, or better. DB Contractor shall differentiate response times for Defects that require prompt attention due to immediate or imminent damage or deterioration, excluding those items which have no impact on any parties other than DB Contractor, and response times for other Defects.

19.6.1 Maintenance Quality Management Plan

Section 2.2.9 includes requirements for maintenance quality management.

19.6.2 Incident and Emergency Management Plan

As part of the MMP for O&M Work, DB Contractor shall prepare and implement an Incident and Emergency Management Plan (IEMP) to address Incident and Emergency response, including:

a. Procedures to identify Incidents and notify Emergency Services providers and establish traffic control for Incident management activities in a timely manner;
b. Procedures for removal of stalled, broken down, wrecked or otherwise incapacitated vehicles from the travel lane, including coordination with Emergency Services/Law enforcement;
c. Procedures to institute all measures to clear the Incident and return lane availability within the specified period of arriving at the Incident;
d. Procedures for cleanup of debris, oil, broken glass, etc. and other such objects foreign to the roadway surface;
e. Procedures to identify, contain, and dispose all Hazardous Material spills;
f. Procedures for automobile towing of Users' light and heavy vehicles at the Users' expense;
g. Descriptions of contact methods, personnel available, and response times for any Emergency condition requiring attention during off-hours.

Where an Incident or Emergency has an effect on the operation of the Project, DB Contractor shall clear obstructions and repair damage to the Project under the supervision of the relevant Emergency Services if necessary, such that the Project is returned to normal operating standards and safe conditions as quickly as possible.

Where liquid or soluble material spills are involved, DB Contractor shall take all necessary measures to minimize pollution of watercourses or groundwater. Where structural damage to structures is suspected, DB Contractor shall cause that a suitably qualified bridge engineer or specialist inspector is available to evaluate the structure and to advise on temporary repairs and shoring needed to provide safe clearance of the Incident or Emergency. Where such an Incident or Emergency involves a personal injury, DB Contractor shall not remove any vehicle or other item that may assist a potential investigation by Emergency Services until authorized to do so by such agency or agencies.

19.6.3 Snow and Ice Control Plan

As part of the MMP, DB Contractor shall prepare and implement a Snow and Ice Control Plan (SICP) that contains detailed operational procedures for performing snow and ice control work. The SICP shall comply with all applicable Law, codes, and regulations governing the operation of equipment on public highways.

The SICP shall address the following:

a. Weather forecasting
b. Advance preparation procedures
c. Call-out procedures
d. Response protocol
e. Operational requirements
f. Training
g. Recordkeeping/Reporting
h. Environmental management
i. Anti-icing and de-icing chemical storage
j. Anti-icing and de-icing materials, including salt and alternative substances
k. Equipment.

As part of MMP updates, DB Contractor shall incorporate any changes in strategy and equipment levels designed to rectify faults identified by DB Contractor and TxDOT in DB Contractor's snow and ice removal operations during the preceding winter season.

DB Contractor shall report to TxDOT information on weather-related events which may cause unsafe driving conditions such as ice, sleet, snow, floods or high winds.

DB Contractor shall maintain the travel way free of snow and ice in compliance with the Performance and Measurement Table During Construction. The presence or forecast of snow or ice shall be assessed as a Category 1 Defect and shall be addressed immediately by DB Contractor upon detection or upon being informed of the condition(s).

19.6.4 Maintenance Document Management Plan

DB Contractor shall develop a Maintenance Document Management Plan (MDMP), which includes procedures to establish and maintain an electronic document control system to store, catalog, and retrieve all Project-related documents and maintenance records in a format compatible with the TRM System used by TxDOT and in compliance with the requirements set forth in Section 2.1.2. 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. .

19.6.5 Maintenance Management System

As part of the MMP, DB Contractor shall implement a computer-based Maintenance Management System (MMS), compatible with TxDOT MMS, to record asset inventory and system condition, Defects, failures, repairs, maintenance records, and inspections performed.

DB Contractor shall provide TxDOT as part of its MMS with all relevant maintained Element information including but not limited to, horizontal and vertical locational accuracy that complies with or exceeds Good Industry Practice, using the posted reference marker number, GIS data and control number for bridge class structures, asset description, date of installation, type of failure, date-time of failure, date-time of response to the site and date-time returned to service, preventive maintenance work, scheduled work, work repair code, and time of failure to time of repair. The MMS shall be able to report O&M Work and Defects by TxDOT "function code", maintained Element, reference marker, and unit of measurement, as the same described in TxDOT's MMS User Manual, to categorize the O&M Work performed by the DB Contractor.

When a maintained Element is constructed, installed, maintained, inspected, modified, replaced or removed, the DB Contractor shall update MMS within three days (3) of completion of such work. Category 1 Defects shall be recorded in the MMS immediately upon the DB Contractor becoming aware of the Defect. Category 2 Defects shall be recorded in the MMS within three (3) days of them coming to the attention of DB Contractor. All other information requirements shall be provided to TxDOT within 15 days of completion or occurrence of the relevant activity.

Prior to NTP2, the MMS shall be fully populated and operational and DB Contractor shall demonstrate to TxDOT the functionality and use of the MMS and that it is fully compliant with the requirements of the Contract Documents. The MMS shall be kept updated and operational for the duration of the O&M Work.

DB Contractor shall repeat the demonstration annually and whenever system changes are implemented. DB Contractor shall transfer inventory and condition data to TxDOT at the date when DB Contractor's MMS is fully operational and transfer the updates of the inventory and condition data annually. At a minimum, the following data shall be transferred to TxDOT:

a. An inventory of all elements, components, and equipment to be maintained;
b. A description of each item with location, tag number, serial number, and equipment nameplate (size, model, and serial number);
c. Inspection history and reports; and
d. Condition data for each element.

DB Contractor shall record within the MMS all complaints and reports from third parties to include:

a. The date and time of the complaint;
b. The location and nature of the problem;
c. Who made the complaint; and
d. Date and action taken to address the complaint.

The MMS shall record all accidents/Incidents related to O&M Work being performed by DB Contractor or within a work zone, including the following information:

a. accidents involving DB Contractor or any Subcontractor personnel, equipment, barricades or tools;
b. traffic accidents within the O&M Limits or in the vicinity of any O&M Work being performed by DB Contractor or any Subcontractors;
c. Releases of Hazardous Materials;
d. any accident involving DB Contractor or the traveling public that causes damage to any Project appurtenance, structure, improvement or fixture;
e. with respect to any accident/Incident, the information provided shall include as a minimum:
    i. The date and time of the accident/Incident;
    ii. The location of the Incident;
    iii. The nature of the Incident;
    iv. All parties involved in the Incident, including names, addresses, telephone numbers and their involvement (including witnesses);

v. Responsible party and insurance information;
vi. Action taken to address the Incident; and
vii. Documentation of traffic control in place at location.

19.6.6 Safety

DB Contractor shall establish and implement safety and health procedures for O&M Work in compliance with Section 2.6.

19.6.7 Communication

DB Contractor shall establish and implement communication procedures for O&M Work in compliance with Section 2.7 and Section 3.

19.6.8 Hazardous Materials Management

DB Contractor shall establish and implement Hazardous Materials Management procedures for O&M Work in compliance with Section 4.3.5.

19.6.9 Environmental Compliance and Mitigation

DB Contractor shall establish and implement environmental compliance and mitigation procedures for O&M Work in compliance with Section 4.3.2.

19.6.10 Traffic Management

DB Contractor shall establish and implement traffic management procedures for O&M Work in compliance with Section 18.

19.7 Reporting

DB Contractor shall submit a monthly report to TxDOT for O&M Work. This monthly report shall include the sections and reporting requirements in Table 19-2.

Table 19-2: Requirements for Monthly Report

Report Sections	Reporting Requirements/Description
Project Status	Report a high-level summary of Project condition and operational status, which shall include at a minimum: i) Tracking log of accident statistics, ii) Tracking log of Lane Closures, iii) Tracking log of public inquiries/complaints, and iv) Tracking log of public contact/outreach activities.
Operational Status	Report a summary of Project condition and operational status, which shall include at a minimum: i) Defects including the location, the nature and cause of the Defect and the steps that will be, or have been, taken to address the Defects per Section 19.4.2. ii) Inspection results per Section 19.5. iii) Accidents, Incidents and Emergencies per Section 19.6.5 including effectiveness of Incident response. iv) Workforce injuries and OSHA related accidents per Section 2.6.
Organizational Status	Report a summary of DB Contractor's organizational status (or reference to the appropriate sections/attachments in the latest MMP for the information) for the items below. i) List of personnel ii) Log of all training activities undertaken and planned

	iii) List of major equipment iv) Subcontractors
Progress Report	Report a summary of DB Contractor's activity, which shall include at a minimum from the previous month: i) Tracking log of completed action items with start and end dates and documentation supporting resolution, ii) Summary of O&M Work, iii) Summary of quality control activities and results, iv) List of any Nonconforming Work with explanation of non-conformance and associated risks, and v) Meetings/correspondence logs
Planned Activities	Report a summary of DB Contractor's planned activity, which shall include at a minimum: i) Tracking log of action items in progress with start and projected end dates with a description of proposed solutions, ii) Schedule of planned O&M Work for the upcoming month, iii) Future Lane Closures including location, duration and reason of each, and iv) 3-month look ahead schedule of planned O&M Work

20 BICYCLE AND PEDESTRIAN FACILITIES

20.1 General Requirements

This Section 20 includes requirements with which DB Contractor shall design and construct all 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 trails and other facilities of local and county administrations for pedestrians and cyclists.

20.2 Administrative Requirements

DB Contractor shall maintain and keep operational all bicycle and pedestrian facilities during construction and throughout the Term of the Agreement.

20.3 Design Requirements

20.3.1 Bicycle Facilities

DB Contractor's facilities shall be consistent with the region's bicycle and pedestrian plan and accommodate existing bicycle paths and crossings, and on-street bicycle facilities. DB Contractor shall coordinate with Governmental Entities to ensure consistency with existing and proposed bicycle facilities as indicated in the FEIS.

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 travel lane
e. Methods of illumination, where applicable
f. Requirements of the *Aesthetics and Landscaping Plan*

20.3.2 Pedestrian Facilities

DB Contractor shall design, construct, and maintain sidewalks along the frontage roads and side streets where sidewalks currently exist and where required by State or federal regulations. Sidewalks and pedestrian facilities shall comply with Americans with Disabilities Act (ADA), the *Texas Accessibility Standards* and Texas Department of Licensing and Regulations (TDLR). DB Contractor shall install pedestrian signals and curb ramps at all existing and proposed signalized intersections. All pedestrian facilities shall be designed to incorporate ambulatory, visibility, and auditory needs of all users and shall include the following Elements relating to pedestrian facilities:

a. Alignment, profile, cross-section, and materials
b. Points of connection to existing and proposed pedestrian facilities
c. Signing, signalization, and pavement markings
d. Separation between pedestrian facilities and the nearest travel lane
e. Methods of illumination, where applicable
f. Requirements of the *Aesthetics and Landscaping Plan*
g. Requirements of *Green Ribbon Project Guidelines* and approved Houston District Standards.

DB Contractor is responsible for obtaining Texas Department of Licensing and Regulation (TDLR) reviews and approvals of pedestrian facility design and construction.

21 TOLLING

21.1 General Requirements

TxDOT will enter into a separate contract with a tolling systems integrator (hereinafter the "Systems Integrator") to provide the Electronic Toll Collection System ("ETCS") for the Project. DB Contractor shall support the installation of the ETCS as described herein. DB Contractor shall coordinate with TxDOT and the Systems Integrator during the design phase to finalize the design of all ETCS-related civil Elements. DB Contractor shall provide access to the Project and coordinate construction activities for the Systems Integrator to construct Systems Integrator's infrastructure, as defined in Section 21.4, for the Toll Zones concurrent with DB Contractor's Work.

21.2 Administrative Requirements

Not applicable.

21.3 Design Requirements

DB Contractor shall coordinate design work in the Toll Zones with TxDOT to determine design requirements specific to the Toll Zones. A listing of TxDOT/DB Contractor/Systems Integrator design responsibilities is provided in Attachment 21-1, Toll Systems Responsibility Matrix.

DB Contractor shall be responsible for designing general roadway items through each Toll Zone including pavement design (toll zone pavement and transition areas), striping, MBGF, concrete traffic barrier and foundation, end treatments, general grading, earthwork, flexible base, embankment, retaining walls, drainage, SW3P, and other typical roadway items included in DB Contractor's Work, to support TxDOT's design of the Systems Integrator's gantry structures, conduit, maintenance areas, and concrete pads for the roadside equipment cabinets, generators and fuel tanks. DB Contractor shall design and provide a finished grade roadside area for Systems Integrator's placement of concrete pads for the tolling infrastructure and the maintenance driveway. The finished grade roadside area shall allow for a maintenance driveway that permits safe use by maintenance personnel and their vehicles. The finished grade area shall be free of ditches or other obstructions which could damage or diminish the function of the tolling equipment. For general guidance, details, and responsibilities, see Attachment 21-2, Typical Toll Zone Layout. Geometric constraints may dictate that the design deviates from the general guidance. In these instances, DB Contractor's final design shall be coordinated with TxDOT TOD to ensure the design meets the Systems Integrator's needs.

DB Contractor shall comply with requirements as shown in Attachment 21-1 and shall utilize Attachment 21-2, as a basis for design.

DB Contractor shall utilize Attachment 21-3, Toll Zone Pavement Details, as a basis for pavement design in the 110' Toll Zone. All reinforcing steel within the 110' Toll Zone shall be epoxy coated; this includes the Toll Zone pavement and other items such as barrier, retaining wall, ties, chairs, etc. DB Contractor shall include conduit stub-ups in the pavement and loop conduit under pavement meeting the Systems Integrator's specification. TxDOT will provide Systems Integrator's loop layout with stub-up locations and joint details for DB Contractor to incorporate into Toll Zone pavement design.

DB Contractor shall design concrete encased duct banks the length of the corridor in accordance with TxDOT HOU standards, and include a minimum of two 3-inch dedicated conduits for tolling, with a minimum of 4 strands of single mode communication fiber per Toll Zone (e.g., 24 Toll Zones would require 96 fiber strands). This will include design of duct banks and fiber to the existing Toll Zones in Segment I-2A and a connection to Segment G. (Note that the design of the duct banks and fiber to the

existing Toll Zones in I-2A needs to consider the fact that the existing Toll Zones in Segment I-2A utilize roadside communication buildings as opposed to equipment cabinets. Note also that the communication building that serves both ramp toll gantry locations at FM 565 is on the southbound side (southbound exit) and the primary communication building that serves both directions of the existing I-2A mainlane toll gantry location is on the southbound side.) In order to access the existing HOU District communications network the DB Contractor shall coordinate with TxDOT, and provide a connection of the proposed tolling fiber to TxDOT hub buildings, existing or new, throughout the project. Daisy chaining of fiber will not be allowed. DB Contractor shall provide conduit with 4 strands of dedicated single mode communication fiber from the duct bank to each Toll Zone to be terminated in a DB Contractor provided termination cabinet adjacent to Systems Integrator's equipment cabinet. The TxDOT approved termination cabinet shall be mounted on a DB Contractor provided concrete pad and sized to accommodate the fiber trunk line, slack and a splice termination count for twice the trunk line fiber count (i.e. 48 count fiber trunk would require 96 splice terminations). For the existing Toll Zones in Segment I-2A, DB Contractor shall install the termination cabinet near or in the existing roadside communication buildings indicated above and in a manner and exact location as specified by the Systems Integrator. All fiber, conduit and termination cabinets designed by the DB Contractor for the toll systems shall be separate from those used for ITS and shall be exclusive to the toll systems. This shall also include pull boxes and pull strings, fiber optic markers, test stations, and tracer wire.

DB Contractor shall design and provide 120/240 volt single phase electric service connections at each Toll Zone, meeting the Systems Integrator's specifications. Typical Systems Integrator power requirements are 10 kVA for both mainlane Toll Zones and for ramp Toll Zones. DB Contractor shall verify Systems Integrator power requirements prior to design. DB Contractor shall provide toll power junction boxes adjacent to the Integrator's roadside equipment cabinet pad at each Toll Zone, in accordance with Systems Integrator's specifications. DB Contractor shall be responsible for designing the electrical conductor between the electrical service connection and the designated DB Contractor provided toll power junction boxes adjacent to the Systems Integrator's roadside equipment cabinet pad at each Toll Zone, in accordance with Systems Integrator's specifications. A minimum of twenty-five (25) feet of conductor shall be coiled in the junction boxes.

TxDOT will be responsible for civil design of the toll infrastructure related to the Systems Integrator's work. TxDOT shall design and provide Systems Integrator's typical Toll Zone layouts to DB Contractor during design and work closely with DB Contractor to coordinate design. TxDOT shall provide design for the Systems Integrator's toll gantries, including foundations and lightning protection. For the DB Contractor's drainage and earthwork design, TxDOT shall provide geometric design for the maintenance areas, concrete pads for roadside equipment cabinets, generators and fuel tanks, and conduit.

TxDOT shall be responsible for the design of static toll rate signs. DB Contractor shall provide to TxDOT, cross sections, finished grade elevations, and any additional design data (e.g. surrounding utilities and signs, ditches, etc.) that is necessary for TxDOT's toll rate sign design.

21.3.1 ETCS Infrastructure Requirements

Mainlane Tolling

Mainlane tolling shall consist of tolled lanes with ETCS at the mainlane toll gantry locations indicated in Section 1 of these Technical Provisions.

Ramp Tolling

Ramp Tolling will consist of ETCS at the ramp toll gantry locations indicated in Section 1 of these Technical Provisions.

Utility and Personnel Access-way

DB Contractor shall furnish and install electric utility power drops, sized per TxDOT design criteria with voltage and load information provided by the Systems Integrator at each Toll Zone location.

21.4 Construction Requirements

DB Contractor shall coordinate construction work in the Toll Zones with TxDOT and Systems Integrator to determine construction requirements specific to the Toll Zones. DB Contractor shall provide access and coordinate with the Systems Integrator during construction to allow for System Integrator's civil construction work to occur concurrently with DB Contractor's Work, in accordance with Section 22.4 of the Agreement.

DB Contractor shall be responsible for constructing general roadway items through each Toll Zone including pavement section (toll zone pavement and transition areas), striping, MBGF, concrete traffic barrier and foundation, end treatments, general grading, earthwork, flexible base, embankment, retaining walls, drainage, SW3P, and other typical roadway items included in DB Contractor's Work, to support the construction of Systems Integrator's gantry structures, conduit, maintenance area surfacing, and concrete pads for the roadside equipment cabinets, generators and fuel tanks. DB Contractor shall provide a finished roadside area for Systems Integrator's placement of concrete pads for the tolling infrastructure and the maintenance driveway. The finished roadside area shall allow for a maintenance driveway that permits safe use by maintenance personnel and their vehicles. The finished grade area shall provide positive drainage, and be free of ditches or other obstructions which could damage or diminish the function of the tolling equipment. For general guidance, details, and responsibilities, see Attachment 21-2, Typical Toll Zone Layout. Geometric constraints may dictate that the design deviates from the general guidance. In these instances, DB Contractor final design shall be coordinated with TxDOT TOD to ensure design meets the Systems Integrator's needs.

A listing of TxDOT/DB Contractor/Systems Integrator construction responsibilities is provided in Attachment 21-1. DB Contractor shall comply with requirements as shown in Attachment 21-1 and shall utilize Attachment 21-2, as a reference for construction.

DB Contractor shall construct the Toll Zone pavement sections in accordance with Attachment 21-3, and shall install conduit stub-ups in the pavement and loop conduit under the pavement, meeting the Systems Integrator's specification. All reinforcing steel in the Toll Zone pavement and other items such as barrier shall be epoxy coated. DB Contractor shall provide exclusive unobstructed access to Systems Integrator at each Toll Zone during Systems Integrator's pavement sensor installation and toll systems testing. To allow for Systems Integrator's testing of the toll systems, the area designated for unobstructed access shall be a minimum of 500 feet from each end of the special Toll Zone pavement section. For the mainlane Toll Zones, the DB Contractor shall provide a minimum of 1,110 feet unobstructed access. For Toll Zones on ramps, access shall be provided for the entire length of the ramp. These 500 foot sections are not required to be constructed using the special Toll Zone pavement section.

DB Contractor shall construct concrete encased duct banks the length of the corridor in accordance with TxDOT HOU standards, and include a minimum of two, 3inch dedicated conduits for tolling, with a minimum of 4 strands of dedicated single mode communication fiber per Toll Zone (E.g. 24 Toll Zones would require 96 fiber strands). This will include construction and installation of concrete encased duct banks and fiber to the existing Toll Zones in Segment I-2A and a connection to Segment G. In order to access the existing HOU District communications network the DB Contractor shall coordinate with TxDOT, and provide a connection of the proposed tolling fiber to TxDOT hub buildings, existing or new, throughout the project. Daisy chaining of fiber will not be allowed. DB Contractor shall provide conduit with four (4) strands of dedicated single mode communication fiber to each Toll Zone to be terminated and tested (pre-installation and post-installation) in a DB Contractor provided termination cabinet

adjacent to Systems Integrator's equipment cabinet. Test results shall be provided to TxDOT TOD. The TxDOT approved termination cabinet shall be mounted on a DB Contractor provided concrete pad and sized to accommodate the fiber trunk line, slack and a splice termination count for twice the trunk line fiber count (i.e. 48 count fiber trunk would require 96 splice terminations). All fiber, conduit and termination cabinets constructed by the DB Contractor for the toll systems shall be separate from those used for ITS and shall be exclusive to the toll systems. This shall also include pull boxes and pull strings, fiber optic markers, test stations and tracer wire.

DB Contractor shall construct and provide 120/240 volt single phase electric service connections at each Toll Zone, meeting the Systems Integrator's specifications. Typical Systems Integrator power requirements are 10 kVA for each mainlane Toll Zone and for ramp Toll Zones. DB Contractor shall verify Systems Integrator power requirements prior to construction. DB Contractor shall be responsible for constructing electrical conductor to designated DB Contractor provided toll junction boxes adjacent to the Systems Integrator's roadside equipment cabinet pad at each Toll Zone, in accordance with Systems Integrator's specifications. A minimum of twenty-five (25) feet of conductor shall be coiled in the junction boxes.

DB Contractor shall coordinate construction schedules with TxDOT and the Systems Integrator for Work taking place within the Toll Zones with specific regard for conduit and grounding under structures and in-pavement loops.

Systems Integrator shall be responsible for installing power and communication conduit and lines from the roadside equipment cabinets/termination cabinets at each Toll Zone to the Systems Integrator's toll systems.

Systems Integrator shall be responsible for fabrication and installation of static toll rate signs and toll entrance signs. DB Contractor shall construct and provide finished grades for installation of static toll rate signs and toll entrance signs.

A listing of DB Contractor/TxDOT/Systems Integrator construction responsibilities is provided in Attachment 21-1. DB Contractor shall comply with requirements as shown in this attachment.