Texas Department of Transportation

TECHNICAL PROVISIONS

FOR

LOOP 1604 WESTERN EXTENSION

Design-Build Project

Addendum No. 2

June 27, 2013

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1 GENERAL

1.1 Project Scope

The Project scope components include the design, construction and maintenance of Loop 1604 from FM 471 (Culebra Road) to SH 16 (Bandera Road) in Bexar County, Texas. The Project scope also includes an Option for the design, construction and maintenance of the Loop 1604/SH 151 interchange.

1.2 Base Scope Description

The Loop 1604 Project is a proposed reconstruction and upgrade of an existing facility comprised generally of the construction and overlay of mainlanes and frontage roads, construction of at-grade ramps and intersection improvements as shown on the Schematic Design. A description of the proposed Work for the facility is provided below:

- Location: From FM 471 (Culebra Road) to SH 16 (Bandera Road)
- Length: Approximately 4.6 miles
- Number of mainlanes: 2 in each direction
- Frontage roads: 2-3 lanes in each direction or as indicated on the Schematic Design
- Mainlane bridges:
    - Southbound over Shaenfield Road
    - Southbound over New Guilbeau Road
    - Southbound over Braun Road
    - Northbound over Shaenfield Road
    - Northbound over New Guilbeau Road
    - Northbound over Braun Road
- Frontage road bridges:
    - Southbound over Helotes Creek
    - Northbound over Helotes Creek
- Ramps:
    - Southbound exit to Shaenfield Road
    - Northbound entrance from Shaenfield Road
    - Southbound entrance from FM 471
    - Northbound exit to FM 471
    - Southbound exit to New Guilbeau Road
    - Northbound entrance from New Guilbeau Road
    - Southbound entrance from Shaenfield Road
    - Northbound exit to Shaenfield Road
    - Southbound exit to Braun Road
    - Northbound entrance from Braun Road
    - Southbound exit to SH 16
    - Northbound entrance from SH 16
    - Southbound entrance from Braun Road
    - Northbound exit to Braun Road
- Intersections:
    - Shaenfield Road (including turnarounds)
    - New Guilbeau Road (including turnarounds)

- Access Drive to Leslie Road

DB Contractor shall maintain the Loop 1604 center median as shown on the Schematic Design. DB Contractor shall not permanently obstruct the mainlane corridor, defined as northbound Loop 1604 mainlane outside edge of pavement to southbound Loop 1604 mainlane outside edge of pavement, as shown on the Schematic Design. However, bridge bents may be constructed in the center median, centered on the Loop 1604 centerline.

1.2.1 Base Scope Limits of Overlay Construction Description

A portion of the Work will be constructing a mill and overlay of existing pavement for the mainlanes, frontage roads, and cross streets, as shown in Attachment 1-1 and defined by the following approximate limits of work, from edge of pavement to edge of pavement, excluding new full-depth pavement construction:

- Northbound Mainlanes:
    - STA 643+50 to STA 697+80
    - STA 739+50 to STA 753+00
    - STA 837+00 to STA 884+60
- Southbound Mainlanes:
    - STA 643+50 to STA 697+80
    - STA 739+50 to STA 753+00
    - STA 837+00 to STA 884+60
- Northbound Frontage Road:
    - STA 97+40 to STA 100+00
    - STA 253+10 to SH 16
- Southbound Frontage Road:
    - STA 93+40 to STA 100+00
    - STA 250+70 to SH 16
- Braun Road, approximately 350’ in each direction from the Loop 1604 centerline
- Turnarounds at Braun Road

Within the limits of the Base Scope, DB Contractor shall not permanently obstruct the Loop 1604 corridor between the Loop 1604 centerline and 15 feet beyond the existing mainlane outside edge of pavement in each direction. However, bridge bents may be constructed in the center median, centered on the Loop 1604 centerline.

1.3 Option Description

The Option is a proposed reconstruction and upgrade of an existing facility comprised generally of the construction and overlay of mainlanes and frontage roads, construction of at-grade ramps, intersection improvements and a direct connector as shown on the Option Schematic Design. A description of the proposed Work for the Option is provided below:

- Location:
    - Along Loop 1604, from approximately 3400 feet south of Valley Meadow Road to FM 471 (Culebra Road)
    - Along SH 151, from approximately 800 feet east of Wiseman Boulevard to Westwood Loop
- Length:

  - Approximately 1.4 miles along SH 151
  - Approximately 1.9 miles along Loop 1604
- Number of SH 151 mainlanes: 2 in each direction
- Frontage roads: 2 lanes along southbound Loop 1604
- Direct connection: 1-lane direct connector from southbound Loop 1604 to eastbound SH 151
- Ramps:
  - Eastbound SH 151 entrance from northbound Loop 1604
  - Southbound Loop 1604 exit to Alamo Ranch Parkway
  - Southbound Loop 1604 entrance from SH 151/Alamo Ranch Parkway
- Bridges:
  - SH 151 mainlane bridge over Loop 1604
  - SH 151 eastbound mainlane bridge over Loop 1604 southbound frontage road
  - SH 151 westbound mainlane bridge over Loop 1604 southbound frontage road
  - SH 151 connector bridge from SH 151 to southbound Loop 1604
  - Southbound Loop 1604 to eastbound SH 151 direct connector

Full-depth pavement construction and reconstruction shall occur at the following approximate locations:

- Eastbound SH 151
  - Eastbound SH 151 STA 503+00 to SH 151 mainlane bridge over Loop 1604
  - SH 151 eastbound mainlane bridge over Loop 1604 southbound frontage road to SH 151 STA 556+00
- Westbound SH 151
  - Westbound SH 151 STA 503+00 to SH 151 mainlane bridge over Loop 1604
  - SH 151 westbound mainlane bridge over Loop 1604 southbound frontage road to SH 151 STA 556+00
- Northbound Loop 1604 entrance ramp to eastbound SH 151
  - Ramp STA 122+40 to Ramp STA 127+40
- Eastbound Alamo Ranch Parkway Re-alignment
  - Eastbound Alamo Ranch Parkway Re-alignment STA 10+00 to Eastbound Alamo Ranch Parkway Re-alignment STA 16+60
- Westbound Alamo Ranch Parkway Re-alignment
  - Westbound Alamo Ranch Parkway Re-alignment STA 10+00 to westbound Alamo Ranch Parkway Re-alignment STA 17+80
- Westbound SH 151 exit ramp to Loop 1604
  - Westbound SH 151 STA 509+60 to westbound SH 151 STA 513+00
- Southbound Loop 1604 to Eastbound SH 151 direct connector (excluding bridge)
- Southbound Loop 1604 frontage road
  - Southbound Loop 1604 frontage road STA 142+60 to southbound Loop 1604 frontage road STA 170+00
- Southbound Loop 1604 connector from SH 151/Alamo Ranch Parkway
  - Southbound Loop 1604 connector STA 103+60 to southbound Loop 1604 connector STA

109+00

- Southbound exit ramp from southbound to eastbound direct connector to frontage road
  - Ramp STA 103+30 to Ramp STA 107+30
- Southbound Loop 1604 entrance ramp from Alamo Ranch Parkway
  - Ramp STA 12+50 to Ramp STA 15+50
- Locations where an existing roadway is widened

Within the limits of the Option, DB Contractor shall not permanently obstruct the Loop 1604 corridor between the Loop 1604 centerline and 15 feet beyond the existing mainlane outside edge of pavement in each direction. However, bridge bents may be constructed in the center median, centered on the Loop 1604 centerline.

The SH 151 bridge at Loop 1604 and the southbound Loop 1604 to eastbound SH 151 direct connector shall be designed and constructed to accommodate a northbound Loop 1604 frontage road corridor width of 38 feet.

1.3.1 Option Limits of Overlay Construction Description

A portion of the Option will be constructing a mill and overlay of existing pavement for certain mainlanes, frontage roads ramps, and cross streets, as shown in Attachment 1-2 and defined by the following general limits of work, from edge of pavement to edge of pavement, excluding proposed full-depth pavement construction:

- SH 151: from approximately 800 feet east of Wiseman Boulevard to Westwood Loop
- Loop 1604: from approximately 3400 feet south of south of Valley Meadow Road to FM 471 (Culebra Road)

1.4 Option Environmental Schematic

DB Contractor shall develop the Option Environmental Schematic for the Option limits described in Section 1.3 for TxDOT review and approval. TxDOT will use this schematic in pursuing environmental clearance for the Option. DB Contractor shall meet the requirements set forth in Attachment 1-3 in developing the Option Environmental Schematic. The Option Environmental Schematic shall be submitted to TxDOT within 60 days of NTP1 and shall be subject to the appropriate submittal requirements in Section 2.2.7.5 and resubmittal requirements in Section 2.2.7.6.

DB Contractor shall provide design support to TxDOT related to the Option Environmental Schematic as TxDOT develops the environmental review document.

1.5 Project Requirements

The Design Documents furnished by the DB Contractor shall provide for a smooth transition from the Project's scope of Work to the existing configuration. The Project shall be designed and constructed to minimize the cost of throw-away construction associated with providing for the transitions to the existing configuration. DB Contractor shall also provide for minimal disruption to traffic operations throughout the performance of the Work.

TxDOT San Antonio District Standards shall take precedence over TxDOT statewide standards, unless noted otherwise in these Technical Provisions.

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 is a collection of several management plan Elements (PMP Elements) describing discrete Elements of the Work as described in Table 2-1 below. The Project Management Plan is an umbrella document that describes DB Contractor's managerial approach, strategy, and safety and quality procedures to design and build the Project and achieve all requirements of the DBA Documents. Within the timelines for implementing each Element of the PMP, the plan shall include details of external auditing procedures.

Table 2-1: Elements of the Project Management Plan

Chapter Title	Section of Technical Provisions That Defines the Chapter Requirements
Project Administration	Section 2
Quality Management Plan • **Design Quality Management** • **Construction Quality Management** • **Maintenance Management**	Sections 2 and 19
Comprehensive Environmental Protection Plan	Section 4
Communications Plan • **Public** • **DB Contractor Entities** • **Local Government and Stakeholders** • **TxDOT**	Section 3
Safety and Health Plan	Section 2
TxDOT – DB Contractor Communications Plan	Section 2

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

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

2.1 Administrative Requirements

2.1.1 Project Schedule

2.1.1.1 General Requirements

The Project Schedule shall define the timeframe for completion of the Project and achievement of milestones, and be used to monitor progress and denote changes that occur during design, construction

and maintenance as well as serving to determine the amount due to DB Contractor for a progress payment.

Before the commencement of any Schedule Activity, DB Contractor shall submit a Project Baseline Schedule (PBS) in accordance with the Work Breakdown Structure (WBS). The planning, design, construction, and completion of the Work shall be undertaken and completed in accordance with the most recent Project Schedule approved by TxDOT.

The scheduling software employed by DB Contractor shall be compatible with the current and any future scheduling software employed by TxDOT (currently Primavera 6.2). Compatible shall mean that the DBContractor-provided electronic file version of a schedule may be loaded or imported by TxDOT using TxDOT's scheduling software with no modifications, preparation, or adjustments to do so.

2.1.1.2 Required Project Baseline Schedule

DB Contractor shall use the Preliminary Project Baseline Schedule (PBS-1) submitted with the Proposal as a foundation to prepare a Project Baseline Schedule and shall submit the Project Baseline Schedule (PBS-2) to TxDOT for review and approval. DB Contractor shall submit the Project Baseline Schedule to TxDOT with a reasonable amount of time for TxDOT review prior to NTP2. TxDOT will review the Project Baseline Schedule within 15 days of submission. In the event that TxDOT does not accept the Project Baseline Schedule, DB Contractor shall revise and resubmit it with changes clearly identified. TxDOT will review each resubmission of the Project Baseline Schedule within 10 days of resubmission. Approval of the Project Baseline Schedule (PBS-2) shall be a condition of NTP2.If the Option is exercised by TxDOT, DB Contractor shall submit a revised Project Baseline Schedule that incorporates the Option to TxDOT within 45 days of NTP3 for TxDOT review prior to NTP4. TxDOT will review the revised Project Baseline Schedule within 15 days of submission. In the event that TxDOT does not accept the revised Project Baseline Schedule, DB Contractor shall revise and resubmit it with changes clearly identified. TxDOT will review each resubmission of the revised Project Baseline Schedule within 10 days of resubmission. Approval of the revised Project Baseline Schedule that incorporates the Option shall be a condition of NTP4.

DB Contractor shall submit a single hardcopy of the PBS on full-size (24" x 36") color plot sheets, along with an electronic version of the schedule in its native format.

Before commencement of any scheduled construction Activity, DB Contractor shall obtain TxDOT approval of the PBS. DB Contractor shall progress and update the PBS through schedule updates until a subsequent version of the PBS is approved by TxDOT.

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

The PBS shall include all major Work activities required under the contract documents, in sufficient detail to monitor and evaluate design and construction progress, from commencement of the Work to Final Acceptance of the Work.

The PBS shall also include activities for property acquisition, Utility Adjustments, permit acquisitions, and interfaces with other projects, localities, municipalities and other Governmental Entities. For each major activity, DB Contractor shall indicate the duration (in Days) required to perform the activity and the anticipated beginning and completion date of each activity. In addition, the PBS shall indicate the sequence of performing each major activity and the logical dependencies and inter-relationships among the activities.

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

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

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

DB Contractor shall allocate the total contract Price and quantities throughout the Project activities in the Project Schedule. Such allocation shall accurately reflect DB Contractor's cost for each Project activity and shall not artificially inflate, imbalance, or front-load line items. The price of each Project activity shall be all-inclusive and shall include all direct and indirect costs, overhead, risks, and profit. Note that cost information will be suppressed on the Proposal submission, but shall be included with DB Contractor's first monthly Project schedule update(s) and submitted with DB Contractor's first Draw Request.

Percent complete shall be used to show activity progress as of the status date. The definition of percent complete for activities shall be made in consultation with TxDOT prior to beginning of scheduled Work. It should only be altered with TxDOT's consent.

DB Contractor shall establish a WBS in line with the WBS shown in Attachment 2-2 with clearly identifiable linkage between the Price Proposal and DB Contractor-designated Project activities, and phases represented in the Project schedule. The WBS for each Work element shall indicate the duration, timing, and logical relationship to other Work Elements, including relationships to Project activities other than the parent Project activity of the particular Work Element. The WBS for each Project activity shall be defined in terms of Work Elements reflecting the types of Work shown in the Price Elements (see DBA). Project activities shall be broken down at a minimum to Work Elements (e.g., bridges may be broken down into foundations, substructure, superstructure, and decks). All Work shall be broken down to similar manageable Work Elements. For Utility Adjustment Work, if Work is not shown as a Project activity itself, such Work shall be shown as a Work Element, where applicable. For mobilization, DB Contractor shall provide a list of Work items that are included in each Project activity or Work Element.

2.1.1.2.1 Project Baseline Schedule Overview

The PBS shall be developed and implemented in the following stages:

a) PBS-1: Preliminary Project Baseline Schedule submitted with the Proposal.

b) PBS-2: DB Contractor shall use the Preliminary Project Baseline Schedule (PBS-1) as a foundation to prepare the PBS-2. DB Contractor shall submit the Project Baseline Schedule (PBS-2) to TxDOT for review and approval. PBS-2 shall reflect the intended execution plan meeting all schedule requirements. Activity quantities related to Schedule of Value costs shall be based upon DB Contractor's proposed design. The data date for PBS-2 shall be the date of NTP1. The approved PBS-2 shall be progressed and updated monthly until a subsequent version (PBS-2+) is approved.

c) PBS-3: Inclusion of final design Elements will be incorporated into the PBS-2 schedule updates

as release for construction (RFC) plans are completed. PBS-3 will be submitted to TxDOT on or before six (6) months after NTP2 and shall reflect all final design elements to date, final quantity assessment for each scheduled construction activity, the updated plan and completed Schedule of Values reflecting final design. DB Contractor shall update PBS-3 monthly until a subsequent revision (PBS-3+) is approved or the Substantial Completion Date, whichever is earlier.

The approved PBS or current approved revised PBS shall remain in force until a subsequent PBS or revised PBS is approved by TxDOT

DB Contractor shall include a separate narrative report with the PBS which describes the general sequence of design and construction, the proposed Critical Path and all Milestone Schedule Deadlines.

DB Contractor shall submit a PBS in accordance with the Work Breakdown Structure (WBS), the minimum requirements of which are included in Attachment 2-2 of the Technical Provisions, Work Breakdown Structure Requirements, which is resource loaded in accordance with Table 2-2, to TxDOT for review and approval. Each Schedule Activity shall be mapped to one of the WBS levels. Each segment of the Work shall be to the same level of detail.

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

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

	Maximum duration of Schedule Activity	No maximum	No maximum	20 Days[1]
Construction	WBS Level	4	4	All levels
	Cost Loading	No	Yes	Yes
	Resource Loading	No	No	Yes
	Maximum duration of Schedule Activity	No maximum	No maximum	20 Days[1]

[1]Unless otherwise approved by TxDOT.

2.1.1.3 Project Status Schedule Updates

DB Contractor shall update, on at least a monthly basis, the approved PBS to reflect the current status of the Project, including approved Change Orders.

Each Project Status Schedule Update shall accurately reflect the status of all activities as of the effective date of the updated PBS. Each Project Status Schedule Update shall indicate the overall completion percentage of the Project.

No changes in activity durations, calendar assignments, logic ties, or constraints will be allowed in the Project Status Schedule Update without the written approval of TxDOT.

The Project Status Schedule Update shall include a schedule narrative report which describes the status of the Project in detail, including progress made that period, plans for the forthcoming period, all potential delays and problems, their estimated effect on the Project Schedule and an overall completion, and whether on, ahead of, or behind schedule.

2.1.1.4 Project Schedule Revisions

Until TxDOT approves a schedule revision, all Project schedule submittals shall be tracked against the previously approved Project Schedule. Accepted revisions shall be incorporated into the Project schedule at the next monthly schedule update.

2.1.2 Document Management

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

2.1.2.1 Document Storage and Retrieval Requirements

DB Contractor shall establish and maintain an electronic document management system to store, catalog, and retrieve all DBA 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 DBA.

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 prior to commencing construction quality acceptance testing. The responsible technician and his/her supervisor shall sign the daily test reports and the results of the daily tests shall be provided to TxDOT within 48-hours after test completion.

In the provision of a document management system, 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.

2.2 Quality Management Plan

DB Contractor shall submit a comprehensive Quality Management Plan to TxDOT for approval that is consistent with and expands upon the preliminary Quality Management Plan submitted with the Proposal. The Quality Management Plan shall comply with ISO 9001:2008 for quality systems, quality plans and quality audits, or most current version, as updated by the International Standards Organization. DB Contractor may elect to obtain formal ISO 9001 certification, but will not be required to do so. The Quality Management Plan shall also comply with the provisions of the *TxDOT Quality Assurance Program for Design-Build Projects with an Optional 15-Year Capital Maintenance Agreement* manual.

2.2.1 General Requirements

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

The complete Quality Management Plan shall incorporate the following features:

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

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

c) DB Contractor shall submit to TxDOT the results of all internal audits within seven Days of their completion**.**

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

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

Inspections, reviews, and testing shall only be performed by personnel with appropriate training and qualifications, for each appropriate item of Work (items produced on and off the Project site) using

appropriate equipment that is accurately calibrated and maintained in good operating condition at an AASHTO (AASHTO R18-10, *Establishing and Implementing a Quality System for Construction Materials Testing Laboratories*) accredited facility, or at a facility with comparable accreditation (e.g., ISO 17025, *General Requirements for the Competence of Testing and Calibration Laboratories*).

2.2.2 Quality Terminology

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

a) Organization: DB Contractor's organization, including any Affiliates and Contractors.

b) Customers: the Users of the roadways, TxDOT, Customer Groups, and key stakeholders that have an adjacent property interest or connecting roadway.

c) Product: the Work.

2.2.3 Quality Management Organization

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

a) The organizational chart that identifies all quality management personnel, their roles, authorities and line reporting relationships.

b) Description of the roles and responsibilities of all quality management personnel and those who have the authority to stop Work including, but not limited to, the Construction Quality Acceptance Firm (CQAF) personnel duties and a clear understanding of all testing and inspection roles and responsibilities.

c) Identification of testing agencies, including information on each agency's capability to provide the specific services required for the Work, certifications held, equipment and location of laboratories for products produced both on and off the Project site.

d) Resumes for all quality management personnel.

2.2.4 Quality Policy

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

2.2.5 Inspection and Testing

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

DB Contractor shall revise its Quality Management Plan when its own quality management organization detects a systemic or fundamental non-conformance in the Work performed 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 Construction 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 shall be submitted to TxDOT within twenty-four (24) hours following the inspection or test.

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

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

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 2-2. 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 in accordance with, but not limited to:

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

b) Equipment in all laboratories shall be calibrated prior to commencing any construction activities or when moved during construction and shall retain the calibration/certification by AASHTO, or TxDOT, as applicable for the duration of the Work.

c) Technicians used to provide testing services shall be certified in accordance with the FHWA's *Construction Quality Assurance for Design-Build Highway Projects*.

2.2.5.4 Supply Source and Material Quality

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

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

The Construction Quality Control 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 Construction Quality Control 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 of this Section 2.2.7.

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

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

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. Unless otherwise stated in the DBA Documents, the DB Contractor shall provide to TxDOT four paper copies and a single electronic copy of each Submittal and at the same time provide to the Design Quality Manager 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 for a particular Submittal. The electronic copy shall be in a suitable format (e.g. PDF) or in the format in which the Work was originally created unless stated otherwise in the DBA Documents.

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 Submittal shall be assigned a unique numeric Submittal number. Revised Submittals shall bear an alphanumeric designation which consists of the unique Submittal number assigned to the original Submittal followed by a letter of the alphabet to represent that it is a subsequent Submittal of the original.

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

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

a) Date of issuance 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 Design Quality Management Plan (DQMP) General Requirements

The DQMP shall describe and include the following general requirements:

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

b) Specific quality control and quality review procedures, including all required forms and checklists, shall be specified for preparing, verifying and checking all Professional Services products to ensure that they are independently checked and back-checked in accordance with generally accepted engineering practices in the State of Texas and the requirements of the DBA Documents. The checking of structural design shall include a set of independent calculations, performed by 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 Professional Services product along with any computer programs being used for such purposes. Design Documents shall be stamped, signed and dated by the Engineer in Responsible Charge for that item, element, or phase of the Work.

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

e) Procedures shall: (i) ensure that DB Contractor personnel are familiar with all the provisions of the DBA Documents concerning their respective responsibilities; (ii) 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 (iii) ensure that the Work is performed according to the DQMP, generally accepted engineering practices in the State of Texas and the DBA Documents.

f) Procedures shall be established for meeting documentation requirements; the filing of design criteria, reports and notes, calculations, plans, specifications, 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 Assurance Manager to perform audits of the Design Firm's quality control procedures under the DQMP.

2.2.7.4 Personnel and Staffing

Professional Services Quality Control Manager. DB Contractor shall assign a Professional Services Quality Control Manager (PSQCM) who shall be responsible for management of quality control program for the design, environmental, ROW, Utilities and survey. The PSQCM shall not be involved with direct scheduling or production activities; and shall report directly to DB Contractor's management team. The PSQCM shall see 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 PSQCM shall be a Registered Professional Engineer.

Design Quality Assurance Manager. DB Contractor shall assign an independent Design Quality Assurance Manager (DQAM) who shall be responsible for management of the quality assurance program for the design, environmental, ROW, Utilities and survey. The DQAM shall work for an independent Design Quality Assurance Firm (DQAF) hired by the DB Contractor; and shall report jointly to TxDOT and the DB Contractor's management team. The DQAM shall carry out assurance and audit functions as outlined in the DQMP. The DQAM shall be a Registered Professional Engineer. The DQAM shall not report to any person or party directly responsible for design or construction production.

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

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

2.2.7.4.1 Design Quality Assurance Staff

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

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

2.2.7.4.2 Design Quality Assurance Staff Levels

The size of the quality assurance staff shall reflect the volume of quality assurance activities necessary for the Work in progress and shall be maintained in accordance with the approved DQMP. The DQAF staff shall perform quality assurance oversight and review.

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

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

2.2.7.5 Professional Services Submittal Review Process

DB Contractor shall conduct a series of working meetings with its Professional Services staff, the internal quality control of DB Contractor staff, the DQAM and TxDOT to establish workflow processes and procedures to be utilized during the design review process that are consistent with the DBA Documents, including these Technical Provisions. 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) Professional Services 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 Professional Services reviews shall be evenly scheduled over the duration of the Professional Services phase of the Work. Sections and packages shall be logically organized into manageable pieces and shall contain sufficient information and details to confirm DB Contractor intent and to validate conditions. DB Contractor shall obtain TxDOT's written approval of the sections, packages and contents, the schedule, and the methodology prior to making the first submittal.

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

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

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

- Option Environmental Schematic Submittal
- Corridor Structure Type Study and Report submittals
- Preliminary Bridge Layout submittals
- Preliminary Design Submittal
- Final Design Submittal
- Any deliverables described in the Technical Provisions
- Exhibits supporting railroad agreements, if applicable
- Design Exceptions and Design Waiver requests

2.2.7.5.1 Final Design Submittal

The Final Design Submittal shall be submitted to TxDOT and the DQAM for general review and the PSQCM shall provide certification of compliance. 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 and the DQAM's concurrence of such a design, the PSQCM shall certify that:

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

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

c) The item or element is ready for construction.

d) DB Contractor has obtained all required Final ROW, Governmental Approvals, and Utility Owner approvals.

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

Prior to certifying the above items, elements, or phases, and upon review and comment of the Final Design Submittal by TxDOT and the DQAM, PSQCM shall schedule a formal review with TxDOT and DQAM.

2.2.7.5.2 Formal Review

PSQCM will conduct a formal review presentation to TxDOT and the DQAM at a location acceptable to TxDOT. The formal review presentation will be held following the TxDOT's and the DQAM's review and comment of the mandatory submittals.

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

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

2.2.7.6 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, PSQCM will conduct an additional formal review of the resubmitted items, elements, or phases. A copy of all correspondence relating to each submittal made to any Governmental Entity with jurisdiction over the project shall be concurrently provided to TxDOT.

2.2.7.7 Certification of Compliance

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

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 and the DQAM, DB Contractor shall provide Final Design package to TxDOT. DB Contractor, as part of its Final Design package, shall include all:

a) Design drawings

b) Design calculations

c) Design reports

d) Specifications

e) Electronic files (pdf and native formats)

f) Documentation required for all Final ROW

g) Governmental Approvals

h) Utility Owner approvals

TxDOT's and the DQAM's concurrence with the PSQCM's certification of compliance will 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 DBA Documents, applicable Law and Governmental Approvals.

Construction on any item, element or phase covered by the PSQCM's certification of compliance of said item, element, or phase shall only progress to the extent covered by the Design Documents included in that statement except for the Work performed in accordance with Section 2.2.7.9 (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 and the DQAM's concurrence, except for the Work performed in accordance with Section 2.2.7.9. Any items, elements or phases of design, subsequent to the certification of compliance from PSQCM, shall be checked and certified by the PSQCM in the same manner indicated above.

If TxDOT or the DQAM determines that the Final Design Documents do not meet the requirements of the DBA Documents, applicable Law and/or the Governmental Approvals, TxDOT or the DQAM 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 DQPM procedures are in place. If construction is in progress, TxDOT may suspend ongoing Work represented by the deficient design and require correction of design and/or construction defects.

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

2.2.7.8 Design Changes

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

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

The designer responsible for the original design shall approve design changes during construction, or design changes to Final Design Documents in writing. If the original designer is no longer available, then after notification to the original designer, 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 a Registered Professional Engineer. In all cases, the PSQCM shall certify in writing that the design change has been:

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

b) Checked in accordance with DB Contractor's approved DQMP, and

c) Prepared consistently with other elements of the original design.

DB Contractor shall request and schedule interim and final RFI formal design review(s) by TxDOT and the DQAM for all design changes made during construction or to the Final Design Plans. All changes made through the RFI process shall be documented in the Record Drawings.

2.2.7.9 Early Start of Construction

The following will set forth the circumstances under which certain items, elements, or phases of the Work may be packaged by DB Contractor to initiate an Early Start of Construction prior to obtaining TxDOT's concurrence of the Final Design for the item, element or phase. The "Early Start of Construction" requirements shall apply to any Work that is performed by DB Contractor prior to receiving TxDOT's and the DQAM's written concurrence with the PSQCM's certification of compliance of the Final Design Submittal for the Work. All such Work is performed at the sole risk of DB Contractor. TxDOT does not consider any items as satisfying the DQMP requirements until the PSQCM has issued a certification of compliance and TxDOT and the DQAM have 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 and the DQAM's concurrence of the Final Design Submittal for the Work, and later determined to be unacceptable by TxDOT, in its sole discretion, shall be revised, removed or otherwise reconfigured to the satisfaction of TxDOT at DB Contractor's sole cost and expense and without any consideration given to an extension of the Completion Deadline.

TxDOT and DB Contractor shall agree on procedures for Early Start of Construction, which procedures shall among other things, include a process for distributing construction documents signed and sealed by a Registered Professional Engineer to TxDOT and DB Contractor's field staff. 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 (Design Quality Management Plan). If, as a result of the review process, construction modification or changes to already completed Work elements performed under the Early Start of Construction are required, DB Contractor shall make any and all construction modifications to already completed construction activities at its sole cost and expense without any entitlement to time extensions or adjustments in the Price.

2.2.8 Construction Quality Management Plan

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

DB Contractor's Construction Quality Management Plan (CQMP) shall contain detailed procedures for 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* and establish a clear distinction between quality control and quality acceptance activities and persons performing them. At a minimum, the CQMP shall specify:

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

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

c) The review and approval of all Portland cement concrete and hot mix asphaltic concrete mix designs by a CQAF Registered Professional Engineer.

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

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

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

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

h) 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 Control Manager (CQCM), 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 DBA Documents, Governmental Approvals and applicable Law, and the Design Documents, as well as that all materials, equipment, and elements of the Work will perform satisfactorily for the purpose intended.

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

n) Measures to ensure that purchased materials, equipment, and services conform to the DBA 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 DBA Documents, the Governmental Approvals, applicable Law or the Design Documents are not used or installed. These procedures shall include identification, documentation, segregation, disposition and notification to TxDOT and, if appropriate, Governmental Entities and other affected third parties, as well as procedures for TxDOT to review Nonconforming Work.

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

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 DBA Documents. It shall specify written test procedures which include provision for ensuring that all prerequisites for the given test have been met and that adequate test instrumentation is available and used. The CQMP shall require test results be documented and evaluated to ensure that test requirements have been satisfied. The CQMP shall also demonstrate how the CQAF will track its testing frequencies to ensure compliance with the DBA Documents.

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 within industry standards.

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.

2.2.8.1 Personnel and Staffing

2.2.8.1.1 Construction Quality Control Manager

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

2.2.8.1.2 Construction Quality Control Staff

DB Contractor's and Subcontractors' construction work force are all considered to be members of DB Contractor's quality control staff as each and every one is responsible for the quality of the Work. Personnel performing QC 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.

2.2.8.1.3 Construction Quality Acceptance Manager

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

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

2.2.8.1.4 Construction Quality Acceptance Staff

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

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

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

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

2.2.8.1.5 Construction Quality Acceptance Staff Levels

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

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

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

2.2.9 Maintenance Management Plan

Section 19 (Maintenance) includes requirements for maintenance management during construction.

2.3 Comprehensive Environmental Protection Plan

Section 4 (Environmental) includes requirements for environmental management.

2.4 Public Information and Communications Plan

Not applicable.

2.5 Safety and Health Plan

DB Contractor shall be responsible for the safety of its personnel and of the general public affected by the Project. All members of the DB Contractor's team shall adhere to the DB Contractor's Safety and Health Plan. DB Contractor shall meet the following Safety and Health Plan content and preparation requirements.

DB Contractor shall submit to TxDOT for approval a comprehensive safety and health plan ("Safety and Health Plan") that is consistent with and expands upon the preliminary safety and health plan submitted with the Proposal.

The 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 and those affected by it. The Safety and Health Plan must cover all phases of the Work, and shall be reviewed, evaluated, and updated as often as necessary to reflect relevant changes during the Term of the DBA.

The Safety and Health Plan shall contain, as a minimum, the following provisions:

a) Safety Management

The personnel and responsible staff who will implement, maintain, and enforce the Safety and Health Plan rules and policies shall be identified. As a minimum, the DB Contractor shall provide a full time on-the-job Safety Manager meeting the qualifications outlined below. In addition, the DB Contractor's safety management team shall also have the minimum additional designated personnel identified below.

The Safety Manager's qualifications, as a minimum, shall include:

- 10 years of progressive safety experience, five years of which must be safety management experience, on complex heavy civil projects;
- Designation as a Certified Safety Professional (CSP);
- Completed the OSHA 10-hour Safety and Health Course;
- Training and current certification for CPR and First Aid;
- Possess verifiable competency in the construction safety disciplines related to the Work to be performed and/or retain fulltime competent persons required by State and Federal safety standards; and
- Knowledgeable in safety incentive programs.

As part of the DB Contractor's safety management, all Work shifts shall have, as a minimum, an onsite shift safety representative. The shift safety representative shall have the following minimum qualifications:

- Three years of progressive safety experience and general competency in the construction safety disciplines related to the Work;
- Completed 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.

A clearly stated policy shall be provided that articulates the obligations of all personnel in adhering to the policy.

Clear goals shall be established and communicated 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. 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.

Incident response plans to ensure the safety and health of personnel involved in the Project and the general public affected by the Project shall be established. In addition, procedures for immediately notifying TxDOT of all incidents arising out of or in connection with the performance of the Work shall be established.

b) Worksite and Jobsite Analysis

A reliable system shall be provided that allows 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 the 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

Methods and procedures shall be provided to identify and detail all hazards that may be encountered by employees while performing the Work. Practices and procedures shall be developed and implemented to address prevention of identified hazards. A communications protocol shall be established 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.

Means shall be provided to ensure employees 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.

The DB Contractor shall handle Hazardous Materials in compliance with Section 6.8 of the DBA and the applicable requirements of the Technical Provisions.

d) Training

Methods shall be established 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.

Methods shall be established 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.

Procedures shall be provided to plan and prepare for Emergencies, and to conduct training and Emergency drills, as required.

e) Drug Free Work Zone

- Policies and procedures shall be provided to require adherence to a 100% drug/alcohol free work zone.

f) Incident and Emergency management

The DB Contractor shall establish procedures to achieve at a minimum, the following:

- Maintain communication for the exchange of information between DB Contractor, TxDOT, and other involved agencies.
- Develop coordinated support through interaction with local, State, and federal governmental entities, as well as other entities, for safe and efficient construction.
- Discuss and coordinate Emergency response, traffic control, security, and operational issues affecting construction of the Project, and associated system feeders and exits.
- Update Participating Agencies regarding status of construction of the Project, and associated system feeders and exits, to assure safe and timely response to Emergency events. As a minimum, this shall include off-site and on-site traffic routing changes, and changes to job 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.

2.6 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 DBA Documents.

2.7 Right of Way Acquisition Plan

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

The ROW Acquisition Survey Document Package 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 Package as complete until the reviewing surveyor has signed and sealed the compliance certificate (see Reference Information Documents for Survey Compliance Certificate Form).

2.8 TxDOT Offices, Equipment and Vehicles

Except where noted elsewhere, DB Contractor and TxDOT shall co-locate for the term of the DBA to facilitate Project coordination and daily communication. The definition of "co-locate" for this DBA is 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:

- Project Manager, Design Manager and at least one CADD technician during the design phase
- Project Manager and Construction Manager during the construction phase

DB Contractor shall provide TxDOT office space (i.e. available for occupancy) within sixty (60) Days of issuance of NTP1. The location, condition and amenities of the office space for TxDOT are subject to TxDOT's prior written approval. The office space requirements for the core office and field offices are provided below.

2.8.1 Computers and Equipment

The DB Contractor shall provide, install and maintain the following computers, peripherals and software for the TxDOT office spaces:

- One computer and monitor including all necessary peripherals for each personnel office area and the reception area.
- Desktop computers shall be Dell Optiplex 580 CPUs with a Dell P2012H flat panel monitor or equivalent.
- Laptop computers shall be a Dell E5439 Latitude with a Dell P2012H flat panel monitor or equivalent.

- Peripherals will include at a minimum, monitor stand, docking station for laptop computers, mouse, keyboard, extra battery for laptop computers and a carry back for laptop computers.
- Necessary software required to perform TxDOT functions for the Project, Microsoft Office Professional, Microsoft Outlook and be compatible with all other Microsoft software products.
- The computers, monitors and peripherals shall be at least equal to the ones used by the DB Contractor's staff.

The DB Contractor shall provide, install and maintain the following telephones, servers, copiers and fax equipment, and premise wiring for the TxDOT office space:

- At least one touch-tone telephone for each personal office area, each with a status indicator, access to all outside lines and conference-call capability; and including speakers for the telephones in the enclosed offices.
- At least one touch-tone conference telephone with satellite microphones for each conference room, each with a status indicator, caller id, access to all outside lines and conference call capability.
- Provide cellular telephones and the appropriate AC/DC chargers and other cords for three TxDOT representatives assigned to the Project.
- Hardware and software compatible with that of Good Industry Practice and of the DB Contractor's system interface.
- One high-speed laser computer printer capable of handling 11"x17" prints.
- One high-speed color printer capable of handling 11"x17" prints.
- One high-speed color photocopy machine capable of handling 11'x17" prints.
- One facsimile transmission machine.
- One color scanner capable of handling 11"x17" prints.

(A multi-purpose piece of equipment capable of meeting multiple parts of the requirements above will be considered to meet the requirements.)

- All office supplies including copier paper, toners, pens, pencils, notepads and other miscellaneous office supplies.
- Provide and install the complete voice/data communications cabling system, which include 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 the DB Contractor can establish, to TxDOT's satisfaction, that alternate hardware and cabling can achieve the same level of service as TxDOT deems necessary to effectively manage this project, then the 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 and field offices. All cable shall be routed, terminated, labeled and tested. Voice and data circuits shall be installed in conjunction with ISD and TxDOT Department of Information Resources staff.
- Certify and state supplied components as functional before installation and will bear all responsibility for replacement of parts at work commencement.
- Prepare test plan and submit before installation, test installed system and supply test results, and shall conform to all industry standard testing procedures.

- 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.
- Each drop shall contain two data ports with RJ45 connectors and two voice ports with RJ11 connectors.
- Provide all materials, as needed and required, to 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.

2.8.2 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 CDA Documents. DB Contractor shall provide office space, not to exceed 2,000 square feet, for TxDOT's design and Project management staff including, the general engineering contractor and other contract employees for a maximum of ten (10) persons. If it is necessary to locate any of these elements of the Work off-site or outside of this office, DB Contractor shall obtain TxDOT's prior written consent.

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

DB Contractor shall have the TxDOT facility area available for move-in no later than sixty (60) days from NTP1.

2.8.2.1 TxDOT Facility Area and Items Provided by DB Contractor

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

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

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

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

1. General. Secure facility space, obtain all permits, install and pay for all utility services, and maintain the facilities as part of the Work.

2. Access and Security. Provide separate TxDOT entrance/exit(s) from building, which shall be secured with door lock(s) plus a deadbolt lock. DB Contractor shall provide keys for entry doors as well as other designated areas (e.g., server room, document storage, offices).

3. 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, with minimum circuit capacity of twenty (20) amperes.

4. Janitorial and Trash Services. Provide daily janitorial service (except Saturdays, Sundays and Holidays) and maintain trash containers and trash pickup service for the building and site areas beyond the TxDOT facility area. This shall include, but not be limited to, sweeping and mopping floors, cleaning restrooms and break room, emptying wastebaskets, and periodic dusting. This service shall be paid for by DB Contractor. DB Contractor will pay for and procure janitorial services for the TxDOT facility area.

5. Exterior Maintenance. Maintain the exterior areas of office spaces, including access to parking areas.

6. 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.

7. Restrooms, Break Room, and Entry Space. Provide access to women's and men's restrooms, break room space and building entry space, these spaces may be shared with DB Contractor's office space/staff. These spaces and all TxDOT spaces shall have access 24 hours per day, 7 days per week, 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, ice machine, sink including waste disposer, microwave, and dishwasher. Break room/kitchen will have storage closet (25 sq. ft.) and cabinets with drawers and counter tops. In the event that access to restrooms cannot be accessed from a common building entry/lobby, DB Contractor may provide separate restrooms for the TxDOT facility area. In the event it is necessary to locate a separate break room and/or restrooms within the TxDOT facility area, the 2,000 SF TxDOT space allocation may be required to be increased to accommodate these spaces.

8. HVAC. Provide electrical, heating, ventilation, and air conditioning (HVAC) systems capable of maintaining temperatures between 65 and 75 degrees Fahrenheit in all spaces, 24 hours per day, 7 days per week, 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.

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

10. Disposal and Removal. Be responsible for disposal or removal of all DB Contractor-provided facilities and any facility and/or site restoration Work as required.

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

1. Offices. Enclosed offices for TxDOT's management staff (nominal 150 square feet each) 5 total with keyed door hardware.

2. Cubicles. Cubicle area spaces for administration staff (nominal 64 square feet each) 5 total; (power supply and data and communication lines to cubicles may be provided through power pole drops).

3. Conference Rooms. One conference room at nominal 12'x 25' (300 SF) All shall have dimmable lighting; each conference room shall have one chair for every 24 SF of conference room space and a conference table of sufficient size for each chair.

4. Reception Area. Receptionist space with waiting area with seating for 4 visitors; other furniture to be determined jointly by DB Contractor and TxDOT.

5. (Not Used)

6. Storage and Filing. One (1) lockable space for storage and filing, nominal 10'x15' (150 SF).

7. Server Room. One computer server room (100 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 nonstatic floor covering, 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.

8. Parking Area. Parking area for at least 20 vehicles (14 staff/6 visitors) that is reasonably level (all-weather surface and all-weather access).

9. 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.

10. Corridors. Corridors within the TxDOT facility shall have a nominal width of 54 inches.

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

1. Flooring. Carpeted flooring (nonstatic in server room).

2. Entry Access. Entry to TxDOT areas by door lock and key.

3. 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.

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

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

6. 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.

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

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

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

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

11. Emergency Contacts. 24-hour emergency contact to DB Contractor.

12. Furniture. DB Contractor-provided allowance of $15,000 in the Price for furniture, which shall be obtained by DB Contractor at the direction of TxDOT, and billed through DB Contractor. At the end of the Project, DB Contractor shall have ownership of the furniture and shall be entitled to the full salvage

value of the furniture, with the right to retain or otherwise dispose of the furniture at its sole discretion, without any further accounting to TxDOT.

2.8.3 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. The field offices can be combined with the core office described in Section 2.8.2 as long as the combined offices meet the requirements of Sections 2.8.2 and 2.8.3except DB Contractor may reduce the combined offices requirement to twelve (12) TxDOT personnel comprising five (5) enclosed offices (nominal 150 square feet each) with keyed door hardware, and seven (7) offices or cubicles (64 square feet each).

Subject to TxDOT's prior written approval, DB Contractor shall provide separate facilities for TxDOT's resident engineer staff located within the same complex as DB Contractor's field office. Should DB Contractor elect to construct the Work using field offices other than the one specified, corresponding facilities shall be provided for TxDOT's exclusive use and shall be at least of the same quality as DB Contractor's counterpart management and field staff.

DB Contractor shall provide the field staff facilities at least ten (10) Business Days prior to starting any Work activity involving staff that will occupy the field staff facilities.

Office Condition. The field office(s) shall be in good and serviceable condition, 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.

Loss or Damage. If office space(s) or related facilities 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) Business Days after the occurrence of such destruction or damage, replace those items that it had provided or repair them to their original condition; however, in the case of lost, damaged, or stolen office equipment (e.g., computers, fax machines, copy machines, printers, etc.) necessary for normal office operations, replacement shall occur within two (2) Business Days. If loss or damage is caused as a direct result of willful misconduct of TxDOT or its personnel, DB Contractor shall replace the facilities noted herein within the timeframes specified herein, except that TxDOT shall reimburse DB Contractor for actual, reasonable, and documented costs incurred.

Office Facilities and Equipment. For the facilities it provides, DB Contractor shall:

1. General. Secure sites, obtain all site permits, install and pay for all utility services, and maintain the facilities as part of the Work.

2. 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 area, from each building or trailer. Each entrance/exit shall be secured with a door lock plus a deadbolt lock.

3. 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.

4. Janitorial and Trash Service. Provide daily janitorial service (except Saturdays, Sundays and Holidays) and maintain trash containers and trash pickup service. This will include, but not be limited to, sweeping and mopping floors, cleaning the toilet, and lavatory and emptying wastebaskets.

5. Exterior Maintenance. Maintain the exterior areas of office spaces, including access to parking areas.

6. Accessibility. Meet all access requirements of the Americans with Disabilities Act, as amended (42 USC §§12101, et seq.).

7. Utility Service. Provide potable water, sewer service, and electricity to the office facility.

8. 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.

9. Code Requirements. Meet all local building and fire code requirements.

10. Disposal and Removal. Be responsible for disposal or removal of all DB Contractor-provided facilities and any site restoration Work as required.

Space Requirements. Although actual space requirements will depend upon Work schedule and geographic locations of the field offices, a typical field office should include the following elements:

1. Offices. Enclosed offices for TxDOT's construction representative, TxDOT-designated construction manager and three other TxDOT or contract employees (150 square feet each).

2. Offices/Cubicles. Offices or cubicles for up to six (6) field engineer/inspection/ administration staff (64 square feet each).

3. Conference Rooms. Conference room (enclosed) (200 square feet)

4. Storage and Filing. Two (2) lockable spaces for storage and filing at each field office (a combined space of 150 square feet).

5. Surveying Equipment Storage. Clean inside storage space for surveying equipment (80 square feet).

6. Tool Shed. Shed for small tools and equipment (outside) (150 square feet).

7. 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.

8. Staff Parking Area. A parking area for at least ten (10) vehicles that is reasonably level (all-weather surface and all-weather access) within the boundaries of a security fence.

9. 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 1,000 square feet).

10. Security. A 24-hour security service or silent watchmen-type security system.

11. 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.

12. Window Security. Security bars on all windows.

13. Laboratory Facility. A completed facility suitable to accommodate a functioning portable lab (approximately 1,000 square feet).

14. Kitchen/Break Room. Each field office shall contain a 200 sq. ft. kitchen with storage closet (25 sq. ft.), cabinets with drawers and counter tops.

15. Restrooms. Two restrooms including toilets and sinks.

16. First Aid Facilities. Emergency first aid facilities.

3 PUBLIC INFORMATION AND COMMUNICATIONS

3.1 General Requirements

DB Contractor shall assist TxDOT with public information activities to ensure that a consistent message is being distributed to the Customer Groups regarding the Project.

DB Contractor shall assist TxDOT in working with residents, communities and neighborhoods within the general vicinity of the Project to mitigate construction impacts to the neighborhoods, particularly during Off-Peak Times.

3.2 Administrative Requirements

3.2.1 Personnel

DB Contractor's Project Manager, or Project Manager's delegate, as approved by TxDOT, shall assist TxDOT with public involvement activities throughout the Term of the DBA.

3.2.2 Emergency Event Communications

For all Emergency events, such as vehicle collisions, ice/snow conditions, and Hazardous Material spills, the Project Manager shall take timely and appropriate action to inform TxDOT, who shall, in turn, inform appropriate Customer Groups of all pertinent details. The Project Manager shall provide these details through the use of appropriate tools to ensure effective communication. The Project Manager shall continue to provide updated information to TxDOT, 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 Project Manager shall continue to provide updated information to TxDOT, as available and on a timely basis, until the Emergency no longer exists.

3.2.2.1 Lane Closures

Subject to the lane closure restrictions set forth in Section 18 (Traffic Control), DB Contractor shall provide TxDOT 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.

For planned lane closures and Emergency event lane closures, as appropriate, DB Contractor shall coordinate lane closures with TxDOT, as needed, to ensure that no conflicts occur. DB Contractor shall provide advance notification of all lane closure notices to TxDOT.

3.2.3 Disseminating Public Information

DB Contractor shall provide the necessary public information to TxDOT in advance of TxDOT preparing and distributing materials regarding Project-related subjects, using all appropriate methods, including, but not limited to: meetings, news releases, telephone correspondence, newsletters, email, hotlines, Highway Conditions Report, dynamic message signs, Web alerts, maps, displays, renderings, presentations, brochures, pamphlets, highway advisory radio and video news releases.

4 ENVIRONMENTAL

4.1 General Requirements

The DB Contractor shall deliver the environmental commitments required by the RFP, DBA Documents, Environmental Laws, Governmental Entities, Governmental Approvals, and all applicable federal and state Laws 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 commitments. The Program 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 Program shall be designed to incorporate all features and guidelines of ISO 14001. The Program 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 Environmental Laws, as well as the documentation required to validate compliance. All monitoring and reporting activities shall be concise, consistent throughout the Term of the DBA as applicable to the activities being performed, and in accordance with the requirements set forth in the Environmental Laws. The program shall also effectively describe the quality control and assurance measures that the DB Contractor will implement to verify the compliance of the program with all applicable Environmental Laws.

The program shall establish and implement environmental permits, issues, and commitments consistent with the Environmental Approvals. The program shall establish a goal of zero environmental violations during the performance of all Work activities. However, should violations occur, the program 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 DBA. 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 Project schematic as presented in the Environmental Approvals. Such approvals may require re-evaluation, amendment, or supplement as the Work progresses or in order to accommodate actions not identified in the Environmental Approvals or covered specifically by existing resource and regulatory agency coordination. Changes to the Project schematic or incorporation of Additional Properties into the Project shall require the validity of existing Environmental Approvals to be reassessed and may require new Environmental Approvals.

The DB Contractor shall be responsible for coordination with Governmental Entities necessary to obtain new Environmental Approvals or amendments to the TxDOT-Provided Approvals except where TxDOT has agreements with Governmental Entities to perform such coordination.

The 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 environmental studies and re-evaluations caused by actions not identified in the Environmental Approvals, actions not covered specifically by existing resource and regulatory agency coordination, or incorporation of Additional Properties into the Project. 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, laws, and regulations. 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 [anticipated] TxDOT-Provided Approvals are:

State Finding of No Significant Impact (FONSI) for the Base Scope and FONSI for the Option.

4.3 Comprehensive Environmental Protection Program (CEPP)

As part of the PMP, the DB Contractor shall develop and implement a Comprehensive Environmental Protection Program (CEPP), applicable throughout the Term of the DBA to establish the approach, requirements and procedures to be employed to protect the environment. The CEPP shall be developed in the form of a comprehensive environmental management 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 system by which the 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. The DB Contractor shall utilize the CEPP to track on-going issues, identify environmental compliances, non-compliances and identify actions required/taken to correct any such non-compliances.

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

a) Environmental Management System (EMS)

b) Environmental Compliance and Mitigation Plan (ECMP)

c) Environmental Protection Training Program (EPTP)

d) Hazardous Materials Management Plan (HMMP)

e) Communication Plan (CP)

f) Construction Monitoring Plan (CMP)

g) Recycling Plan (RP)

h) Environmental team resumes

The date by the CEPP is to be submitted for TxDOT approval is set forth in Attachment 2-1. 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 EMS shall establish a schedule for periodic CEPP review to ensure it is up to date. The EMS shall provide a means to track the reviews and results. At a minimum, the EMS shall require documents in the following list to be on file at the Site and available at any time for TxDOT review:

a) CEPP component parts

b) Weekly Environmental Monitoring Reports

c) Investigative Work Plans, Site Investigation Reports, and Remedial Action Plans as necessary for hazardous material discovery/remediation

d) 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

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

o) Records of karst feature monitoring and mitigation

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

The State shall ensure that EPIC sheets shall include the Environmental Commitments required to ensure that any discharge from the Project 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 permit(s) issued to TxDOT by the USACE (U.S. Army Corps of Engineers) and associated Section 401 State Water Quality Certification(s) as administered by the TCEQ (Texas Commission on Environmental Quality) as well as any additional Section 404 permits and 401 certifications issued to the DB Contractor during the life of the Project. The documentation at a minimum shall include:

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

b) Process for communicating the terms and conditions of all USACE 404 permits and TCEQ 401 certifications and other permits as necessary,

c) Procedures for carrying out any required mitigation,

d) Procedures for handling off-right-of-way Project Specific Locations (PSL) as required by all Section 404 permit(s) issued to either TxDOT or the DB Contractor by the USACE.

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

The DB Contractor shall document how they will comply 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 schematic and any off- right-of-way PSL within one linear mile of the project limits to comply with the CGP and the project's SW3P,

c) Procedures for handling non-compliance issues,

d) Escalation procedures for SW3P items,

e) Procedures for implementing Detention Best Management Practices.

- **State Listed Species and Unregulated Habitat**

DB Contractor shall document how they will address state listed species and unregulated habitat. The documentation shall be in agreement with all MOU's and MOA 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 how they shall comply with the Endangered Species Act (ESA) and the Fish and Wildlife Coordination Act (FWCA). The documentation shall reflect that coordination with U.S. Fish and Wildlife Service (USFWS) shall be conducted by TxDOT. The documentation at a minimum shall include:

a) Process for training personnel on the requirements of the ESA and FWCA,

b) Process for communicating any commitments regarding ESA and FWCA,

c) Procedures for complying with any commitments including mitigation,

d) Process for mobilization of Karst Species Specialist.

- **Traffic Noise**

The DB Contractor shall document how they will address traffic noise mitigation. The documentation at a minimum shall include:

a) Process for carrying out noise mitigation measures as identified and discussed in the approved environmental document and schematic and any supplemental noise studies completed by 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 environmental 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 Schematic Design and Schematic 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 public notification and involvement per TxDOT Guidelines for Analysis and Abatement of Highway Traffic noise and in accordance with Section 3 of the Technical Provisions. DB Contractor shall allow fifteen (15) Days for adjacent affected property 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 observations 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 for Construction and Maintenance of Highways, Streets, and Bridges, 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,

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 DBA. 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.

Subsequent to issuance of NTP1 and, if the Option is exercised by TxDOT, NTP3, DB Contractor shall be responsible for performing any necessary cultural resource surveys, evaluations, testing, and mitigation in those areas outside the footprint of the Project ROW shown on the schematics and within the area of potential effects. The DB Contractor shall coordinate all necessary Antiquities Permits through TxDOT. Antiquities Permits shall be obtained from the Texas Historical Commission (THC) for archeological surveys, testing, monitoring, and data recovery.

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

If evidence of possible cultural resources is encountered during the course of the Work, the DB Contractor shall immediately cease Work in the immediate area and contact TxDOT to initiate post-review discovery procedures under the provisions of the PA among TxDOT, State Historic Preservations Office (SHPO), FHWA, and ACHP as well as the MOU between TxDOT and the THC, if applicable. The DB Contractor shall undertake appropriate measures to protect the site from further intrusion to the extent feasible until an evaluation of the site can be made by a qualified representative from the Governmental Entity responsible for the evaluation. 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;

d) Complying with jurisdictional waters and wetlands permits; and

e) Identifying karst voids/caves and mitigating impacts to karst species during construction.

4.3.3 Environmental Protection Training Plan (EPTP)

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

a) Educate every worker to:

- Recognize the overall importance of environmental issues to constructing, operating and maintaining a successful Project.
- 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.

4.3.3.1 EPTP Scope and Content

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

a) Overall importance of environmental protection to the Project, including karst species.

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) Wetlands identification.

f) Environmental Approvals terms and conditions including an overview of the provisions of the ESA, Migratory Bird Treaty Act, and Stormwater Pollution Prevention Program (SW3P).

g) BMPs for environmental compliance, including pollution prevention, erosion, sedimentation, post construction controls, and dust control measures to maintain water and air quality.

h) Required mitigation measures, including karst species.

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

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

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

l) Groundwater protection requirements.

m) CWA regulations and surface water protection requirements.

n) Overview of noise and residential impact reduction procedures.

o) Air quality requirements.

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

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

4.3.4 EPTP Participation

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

4.3.4.1 EPTP Schedule

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

4.3.5 Hazardous Materials Management Plan (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 Project Site by the DB Contractor, encountered or brought onto the Project site by a third party, or otherwise, during the Term of the DBA. The DB Contractor shall submit the final Hazardous Materials Management Plan to TxDOT for review and approval in its good faith discretion within sixty (60) Days of NTP1; approval of the Plan by TxDOT shall be a condition of commencement of Construction Work.

The Hazardous Materials Management Plan 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 DBA.

b) Designated individuals responsible for implementation of the plan,

c) Procedures for identifying and documenting potential contaminated sites which might impact Project development,

d) Procedures for mitigation of known contaminated sites anticipated to impact construction,

e) Procedures for mitigation of unanticipated contaminated sites encountered during construction,

f) Procedures for mitigation of contamination during the operation and maintenance of the Project,

g) Procedures for developing a detailed Spill Response Plan for the Term of the DBA,

h) Process for training personnel for responding to and mitigating Incidents involving contamination or waste

i) Provisions for appropriate storage and disposal of all waste encountered or disposed of on the Project for the Term.

j) Provision for a Hazardous Materials training module as an Element of the EPTP component of the CEPP.

k) Procedures for preparing an Investigative Work Plan (IWP) and Site Investigative Report (SIR) in the event that Hazardous Materials are discovered during construction; operations or maintenance activities.

l) Identification and contact information for designated responsible individuals.

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 Contractors 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.

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

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

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

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

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

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

4.3.6 Communication Plan (CP)

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 DBA Documents. The CMP shall establish and/or document schedules, protocols and methodologies to be used for monitoring Work with an emphasis on timely reporting, corrective actions and adaptive management. The CMP shall establish reporting procedures, identify reporting requirements and establish controls for report distribution and records retention. All Environmental Monitoring Reports shall be made available for review by TxDOT at TxDOT's request. Should any non-compliance or violation be observed that represents an imminent danger to human health or the environment, the CMP shall include procedures to cause immediate notification of TxDOT.

Prior to NTP2 for the Base Scope and NTP4 for the Option, if the Option is exercised by TxDOT, 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 2-week 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.

At a minimum, DB Contractor shall conduct a yearly inspection and repair any of the above mentioned deficiencies in the storm water system. For the Base Scope, the yearly inspections shall occur within 30 days of the anniversary date of NTP2 through Final Acceptance of the Base Scope. For the Option, the yearly inspections shall occur within 30 days of the anniversary date of NTP4 through Final Acceptance of the Option, if the Option is exercised by TxDOT.

4.3.8 Recycling Plan

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.

4.3.9 Karst Investigation Plan

The karst investigation plan shall document and fully detail the DB Contractor's commitment to protecting known and unknown karst features and the protected habitat existing in the karst features. The karst investigation plan shall document the DB Contractor's proposed approach for identifying karst features, notifying and coordinating with the proper authorities, ensuring proper documentation, mitigating the site and managing compliance.

4.4 Environmental Personnel

DB Contractor, acting through the Environmental Compliance Manager (ECM), shall designate an Environmental Team (ET), as detailed in this section, to prevent, minimize, and/or correct any violation of or noncompliance with Environmental Approvals. The ET shall include Environmental Training Staff, Environmental Compliance Inspectors (ECIs), Karst Species Specialist, 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. Should DB Contractor desire to replace ECM, DB Contractor shall submit to TxDOT the resume of a replacement candidate. The replacement candidate shall be available fulltime within thirty (30) Days after delivery of TxDOT's written acceptance. In the absence of the Environmental Compliance Manager, DB Contractor's Hazardous Materials Manager shall act as an interim Environmental Compliance Manager.

The ECM candidate shall have at least five years of experience successfully managing environmental compliance of urban freeway construction. The qualifying experience used to evaluate an ECM candidate must include the following experience:

a) Developing and managing a storm water pollution prevention plan;

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 Permit conditions.

The Environmental Compliance Manager's qualifying experience must demonstrate the Manager 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), and

c) Requirements of Section 404/401 and permit provisions.

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. Environmental Training Staff members shall have at least one year of experience providing environmental compliance inspection for 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 all violations, compliance, and noncompliance 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.

The ECIs shall have at least one year operational control experience of Storm Water Pollution Prevention Plan activities.

4.4.4 Karst Species Specialist

The ECM shall designate a biologist, recognized by the U. S. Fish and Wildlife Service (USFWS) as a qualified Karst Species Specialist in the identification and habitat assessment of karst invertebrate species, to investigate any karst voids/caves discovered during construction of the Project. The Karst Species Specialist must have, or be able to obtain, a scientific collection permit from the USFWS and must have experience in consultation and coordination for a USFWS Section 10(a)(1)(B) permit.

Upon the discovery of a potential karst species, the Karst Species Specialist shall be on-site within four hours. The DB Contractor shall identify a secondary Karst Species Specialist, meeting the criteria listed above, in case the primary Karst Species Specialist is unable to respond to the Project site. The secondary contact should be included on the environmental contact tree.

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 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 Storm Water Pollution Prevention Plans and be able to demonstrate a working knowledge of the Texas Pollutant Discharge Elimination System and MS4 permit requirements applicable to the Project.

The Water Quality Specialist shall meet the certification requirements of TxDOT Work Category 2.4.1, "Nationwide Permit" and TxDOT Work Category 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 DBA. 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 of experience in similar projects in the following areas:

a) Experienced in developing IWPs, SIRs, and remedial action plans or equivalent reports necessary and acceptable to the TCEQ in material discovery and remediation efforts of Hazardous Materials.
b) Experienced in TCEQ guidance for the investigation and remediation of Hazardous Materials under the TCEQ Voluntary Cleanup Program and Texas Risk Reduction Program Rules.

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

4.5 Property Access

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

4.8 Lead Based Paint (LBP)

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

4.9 Hazardous Materials Traps

DB Contractor shall maintain existing hazardous materials traps at all times during the Work.

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 Reference Information Documents.

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

In accordance with current and subsequent third party 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 30 days from receipt of TxDOT's request for payment.

5.2 Traffic Signals

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

DB Contractor shall assume and execute TxDOT's responsibilities and duties as defined in Attachment 5-1 Municipal Maintenance Agreement Operation and Maintenance of Traffic Signals.

5.3 Roadway Illumination

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

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

DB Contractor shall assume and execute TxDOT's responsibilities and duties as defined in Attachment 5-2 Municipal Maintenance Agreement Highway 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 a plan, the 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.

DB Contractor shall coordinate with Lone Star Logos prior to NTP and as appropriate during the Term to schedule removal, replacement and/or relocation of logo signs within the Project limits.

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, Utility Forms. 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. TxDOT will assist DB Contractor in the Utility Adjustment process, to the extent described in the DBA Documents. Some Utility Adjustments may be performed by the Utility Owner with its own forces and/or contractors and consultants (i.e., owner-managed); all others shall be performed by DB Contractor with its own forces and/or Contractors and consultants (subject to any approval rights required by the Utility Owner for those working on its facilities) (i.e., DB Contractor-managed). The allocation of responsibility for the Utility Adjustment Work between DB Contractor and the Utility Owners shall be specified in the Utility Agreements as described in Section 6.1.3.

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 the Service Commencement Date, are set forth in Section 6.7 of the DBA.

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

6.1.1 When Utility Adjustment is Required

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

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

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 (unless prepared by the Utility Owner) and securing execution (by DB Contractor and the Utility Owner) of all necessary Utility Agreements.

All Utility Agreements must be approved by TxDOT prior to taking effect.

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 providing for same becomes fully effective. DB Contractor shall perform all coordination necessary for Betterments.

6.1.2.3 Protection in Place

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

6.1.2.4 Abandonment and Removal

DB Contractor shall make all arrangements and perform all work necessary to complete each abandonment or removal (and disposal) of a Utility in accordance with the requirements listed in Section 6.2.1 (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. Abandonment of Utilities in place shall require approval 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. The Service Lines 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.

6.1.3 Agreements Between DB Contractor and Utility Owners

Except as otherwise stated in this Section 6 or in the DBA, 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 Adjustment 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 in accordance with Transportation Code 203.092, a Utility Joint Use Acknowledgement and set of plans detailing UAR compliance is required. If the Utility Owner elects the DB Contractor to perform construction work that is not reimbursable, then a DB Contractor managed PUAA is required,

6.1.3.1 Project Utility Adjustment Agreements (PUAA)

DB Contractor shall enter into one or more PUAAs with each affected Utility Owner that is reimbursable 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 Utility

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

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

On issuance of NTP1 for the Base Scope and NTP3 for the Option, if the Option is exercised by TxDOT, DB Contractor shall begin negotiations with each affected Utility Owner to reach agreement on one or more PUAAs that are determined to be reimbursable based on the utility owner having a compensable property interest in the land occupied by the facility to be relocated. DB Contractor shall finalize the necessary PUAAs with each affected Utility Owner within a reasonable time period after issuance of NTP1 for the Base Scope and NTP3 for the Option. DB Contractor shall include any proposed changes to a standard form (other than filling in blanks specific to a particular Utility Owner) in a Utility Owner-specific addendum. Each PUAA (including the Utility Adjustment Plans attached thereto) shall be subject to TxDOT review and approval as part of a Utility Assembly.

Language modification to a PUAA shall be approved by TxDOT 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 standard form included in Attachment 6-1, Utility Forms. DB Contractor shall not modify the standard forms except by approval of TxDOT. DB Contractor shall include any proposed changes to a standard form (other than filling in the blanks specific to a particular Utility Owner) in a Utility Owner specific addendum.

Language modification to a UAA 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 DBA Documents and the applicable Utility Agreement(s).

6.2 Administrative Requirements

6.2.1 Standards

All Utility Adjustment Work shall comply with all applicable Laws, Codes, Regulations, UAR and the DBA Documents, including the Utility Adjustment Standards, the TxDOT *Utility Manual*, Section 6.7 of the DBA, and the requirements specified in this Section 6.

6.2.2 Communications

6.2.2.1 Communication with Utility Owners

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

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

6.2.2.2 Meetings

At least three 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 Business Days after the conclusion of such meetings. At a minimum, DB Contractor shall include the following items in the meeting minutes:

- A complete list of attendees (including their affiliations, telephone numbers, and e-mail addresses)
- Documentation of the issues discussed and any associated solutions
- 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), and a DB Contractor Utility Coordinator (DUC) as described herein.

The UM's primary work responsibility shall be the performance of all DB Contractor's obligations with respect to Utility Adjustments. The Utility Manager shall have a bachelor's degree, and have at least four (4) years of relevant experience in coordinating and solving complex utility adjustments on highway improvement projects. The Utility Manager should be authorized by the DB Contractor 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. The UDC shall be responsible for coordinating the Utility Adjustment design with the overall highway design features during the planning, design, and construction phases of the Work.

6.2.4 Real Property Matters

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

6.2.4.1 Documentation of Existing Utility Property Interests -- Affidavits

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

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:

1. 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.
2. 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:
   a) The files and records must be kept separate and apart from all acquisition files and records for the Project ROW.
   b) 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.
   c) Any DB Contractor-Related Entity personnel negotiating the acquisition of Replacement Utility Property Interests must be different from those negotiating the acquisition of Project ROW.

DB Contractor is not responsible for Utility Owner condemnation proceedings.

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 (i) remaining in its original location or (ii) 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 TxDOT's standard form included in Attachment 6-1, Utility Forms. Each Quitclaim Deed shall be subject to TxDOT's approval as part of a Utility Assembly approval as described below.

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

6.2.4.5 Utility Joint Use Acknowledgements

DB Contractor shall prepare a Utility Joint Use Acknowledgment (UJUA) for:

1. Each Utility proposed to be relocated within the Project ROW
2. Each Utility proposed to remain in its existing location within the Project ROW
3. Any Existing Utility Property Interest located within the Project ROW that is not required to be relinquished pursuant to Section 6.2.4.3 (Relinquishment of Existing Utility Property Interests), and is not addressed in the foregoing clause (a) or clause (b)

DB Contractor shall prepare all Utility Joint Use Acknowledgments using TxDOT's standard form included in Attachment 6-1, Utility Forms. DB Contractor also shall prepare all required documentation to be included with each Utility Joint Use Acknowledgment.

DB Contractor shall arrange for the Utility Owner to execute each Utility Joint Use Acknowledgment. Each Utility Joint Use Acknowledgment (executed by the Utility Owner) shall be subject to TxDOT's approval as part of a Utility Assembly.

6.2.4.6 Documentation Requirements

DB Contractor shall prepare, negotiate (to the extent permitted by this Section 6.2.4 (Real Property Matters), 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 (*four-digit number beginning with 0001*)(ex. LP1604-U-0001), 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 ascertaining, at its own expense, all pertinent details of 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 for the Base Scope or no later than 90 days after NTP4 or 30 days before the first assembly package is submitted for the Option, if the Option is exercised by TxDOT, 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 Utility Strip Map shall be 1"=100'. DB Contractor shall update the information provided in the Utility Strip Map with SUE data and shall submit the same to TxDOT in accordance with the PMP.

6.3.2 Technical Criteria and Performance Standards

All design plans for Utility Adjustment Work, whether furnished by DB Contractor or by the Utility Owner, shall be consistent and compatible with the following:

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

b) The Project as initially designed

c) Any Utilities remaining in, or being installed in, the same vicinity

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 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, the existing Utilities to remain, proposed location of each Utility and DB Contractor's Utility Adjustment recommendations.

In accordance with the PMP, DB Contractor shall submit the proposed Utility Adjustment Concept Plans(s) to TxDOT for its review. The Utility Adjustment Concept Plan(s) shall be submitted in both tabular and plan formats. The 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. DB Contractor shall update the Utility Adjustment Concept Plan as the Work progresses.

6.3.4 Utility Adjustment Plans

Utility Adjustment Plans, whether furnished by DB Contractor or by the Utility Owner, shall be signed and sealed by a Registered Professional Engineer (PE) 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-submit to TxDOT as necessary to obtain TxDOT's approval.

6.3.4.2 Plans Prepared by the Utility Owner

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

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 final 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.

b) A completed Utility Assembly Checklist.

c) A TxDOT approved Utility Adjustment Agreement.

d) Plans which:

   1. Show the existing and proposed Utility facilities,
   2. Show existing and proposed grades for all utility crossings,
   3. Show the existing and final ROW lines along with the Control of access denial line,
   4. Show an offset distance from the final ROW line to all longitudinal Utilities within the final ROW.
   5. Present sufficient information to enable TxDOT to verify compliance with the UAR requirements for each Utility located within the final ROW, including highway design features.
   6. 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. The estimate must list the estimated amount of reimbursement to the Utility Owner, taking into consideration the betterment credit calculation, salvage credit and any applicable eligibility ratio.

f) A proposed Utility Joint Use Acknowledgement

g) Statement of Work form, if applicable

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

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.

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 a transmittal memo, Utility Assembly Checklist, proposed UAAA cost estimate, a proposed UAAA which has been executed by the Utility Owner and DB Contractor (one original in each of the two original Supplemental Utility Assemblies), including all required attachments, and applicable revisions to the Utility Adjustment Plans, as well as Utility Joint Use Acknowledgement(s) and Affidavit(s) of Property Interest, if applicable. The transmittal memo shall briefly describe the desired amendment and explain why the amendment is necessary including an estimated start date and duration.

Abbreviated Utility Assemblies. DB Contractor shall prepare an Abbreviated Utility Assembly for each Utility proposed to remain at its original location within the Project ROW that is not required to be addressed in a PUAA or UAAA, unless an Adjustment is required pursuant to Section 6.1.1. An Abbreviated Utility Assembly is also required for adjustments/relocations where no reimbursement is required to the Utility Owner in accordance with Transportation Code 203.092. 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, Utility Joint Use Acknowledge, certification form and plans detailing UAR compliance. Each of the foregoing items shall comply with the requirements for same described in Attachment 6-1, Utility Forms.

6.4 Construction

6.4.1 Reserved

6.4.2 General Construction Criteria

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

a) All criteria identified in Section 6.3.2 (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)

f) Utilities standards provided in the Utility Agreement

6.4.3 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.

6.4.4 Scheduling Utility Adjustment Work

The Utility Adjustment Work (other than construction) may begin at any time following issuance of NTP1for the Base Scope and NTP3 for the Option, if the Option is exercised by TxDOT. Refer to Section 4.4.1 of DBA for the conditions to commencement 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 that will affect the Project ROW, availability and access to that portion of the Project ROW has been obtained in accordance with the applicable requirements of the DBA Documents.
e) If applicable, the Alternate Procedure List has been approved by FHWA, and either (a) the affected Utility is on the approved Alternate Procedure List, as supplemented, or (b) the Utility Owner is on the approved Alternate Procedure List, as supplemented.
f) The review and comment process has been completed and required approvals have been obtained for the Utility Assembly covering the Utility Adjustment.
g) All Governmental Approvals necessary for the Utility Adjustment construction have been obtained, and any pre-construction requirements contained in those Governmental Approvals have been satisfied.
h) All other conditions to that Work stated in the DBA Documents have been satisfied.

6.4.5 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.

6.4.6 Emergency Procedures

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

6.4.7 Utility Adjustment Field Modifications

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

a) The Utility Owner's review and approval of a Utility Adjustment Field Modification proposed by DB Contractor, or DB Contractor's review and approval of a Utility Adjustment Field Modification proposed by the Utility Owner. The UAFM shall have approval prior to commencement of construction. All revisions shall be signed and sealed by a PE and formally submitted to TxDOT for review and approval;

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

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

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

6.4.8 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.

6.4.9 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 not later than 90 Days after Utility Owner acceptance as defined in the Utility Agreement, the Adjustment or before such earlier deadline as is specified elsewhere in the DBA Documents.

6.4.10 Maintenance of Utility Service

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 to the Utility Facility that is agreed to by the Utility Owner.

6.4.11 Traffic Control

DB Contractor shall be responsible for the Traffic Management Plan. The Traffic Management Plan shall cover, all traffic control made necessary by for Utility Adjustment Work, whether performed by DB Contractor or by the Utility Owner. Traffic control for Adjustments shall be coordinated with, and subject to approval by, the local agency(ies) with jurisdiction. Traffic control shall comply with the guidelines of the TMUTCD and of Section 18 (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 3.1.2.3 of the DBA. All deliverables shall conform to the standards required in the Project Management Plan.

6.5.1 Maximum Number of Submittals

DB Contractor shall coordinate all Submittals required pursuant to this Section 6.5, so as not to overburden TxDOT's staff and consultants. In each calendar week, DB Contractor shall not submit more than:

a) Two Utility Assemblies (excluding Supplemental or Abbreviated Utility Assemblies)

b) Two of any documentation constituting any of the following:

- A modified or additional item submitted in response to TxDOT comments on a particular Utility Assembly
- A Quitclaim Deed
- Any other type of relinquishment document

c) Two Supplemental Utility Assemblies;

d) Two Utility Adjustment Agreements, Amendment Assemblies.

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 calendar week (or weeks), as necessary.

6.5.2 DB Contractor's Utility Tracking Report

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

a) The name of the Utility Owner and a unique tracking number starting with the prefix "Highway U-" followed by a four digit number starting with 0001- to be assigned by the DB Contractor;

b) Utility size and type;

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

d) The proposed method of treatment;

e) State whether the adjustment will be owner or DB Contractor managed;

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

g) Dates on which the UJUA 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 or UAAA;

k) Amounts and dates of payments made by the 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;

n) Whether any betterment is included in the adjustment

The Utility Tracking Report shall also include a separate section for Replacement Utility Property Interest including each necessary Replacement Utility Property Interest with the names of property owners or parcel number(s), Utility Assembly Numbers, status of the acquisition, acquisition cost, and other information as necessary. DB Contractor shall maintain this section of the Utility Tracking Report and submit to TxDOT in the same manner as all other portions of the Utility Tracking Report.

6.5.3 Utility Assembly Submittals

The following procedure shall govern submittal and review of each Utility Assembly, including Supplemental and Abbreviated Utility Assemblies:

a) Before submitting a Utility Assembly to TxDOT, DB Contractor shall:
   - Verify that each subject Utility (or the Utility Owner) is on the approved Alternate Procedure List, if applicable;
   - Submit the complete Utility Assembly to the quality control/quality assurance entity designated by DB Contractor in accordance with the PMP; and
   - 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 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.

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 3.1.3 of the DBA 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 originals of any approved UJUA and of any other components of the Utility Assembly for which this Section 6 requires TxDOT's signature.

6.5.4 FHWA Alternate Procedure

The DB Contractor will develop the Alternate Procedure List that includes the utility owner's name, approximate station numbers and estimated cost. TxDOT will then submit to the FHWA the Alternate Procedure List in order to obtain FHWA authorization for federal reimbursement promptly upon determining that any additional Utility Owner not referenced on the Alternative Procedure List is impacted by the Project, DB Contractor shall submit to TxDOT all documentation as referenced above in order to update the Alternative Procedure List.

TxDOT will forward the approved Alternate Procedure List (and any amendments thereto) to DB Contractor, promptly upon receipt of same from the FHWA.

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 DBA.

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 displaces; 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 DBA, DB Contractor's Project ROW staff and/or Contractors will function as independent contractors while acquiring Project ROW, and not as an agent, representative, or employee of TxDOT.

If DB Contractor obtains a Property Agreement to facilitate design, construction or maintenance in relation to the Project, DB Contractor shall provide a copy of the agreement to TxDOT.

7.2 Administrative Requirements

7.2.1 Standards

Project ROW shall be acquired in accordance with State and federal Law and the practices, guidelines, procedures, and methods contained in the following as it pertains 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 *Appraisal and Review Manual*

Pursuant to the applicable federal regulations, DB Contractor shall (i) acquire ROW parcels for the Project on behalf of the State, but without the direct participation of TxDOT, subject to TxDOT's rights of review, approval, and audit; (ii) certify acceptance of the TxDOT *Right of Way Manual*; (iii) provide adequate access to all occupied properties; (iv) maintain Utility service to occupied properties until relocation is complete; and (v) not permit open burning within 1000 feet of an occupied dwelling.

DB Contractor shall maintain a complete and current set of the TxDOT *Right of Way Manual* Collection, Volumes 1 through 8 (available online at http://onlinemanuals.txdot.gov/manuals), TxDOT *Access Management Manual*, TxDOT *Appraisal and Review Manual*, and a current approved Project ROW map for public use. Any TxDOT forms referenced in this section shall be found in the TxDOT *Right of Way Manual* Collection or will be provided by TxDOT.

All Project ROW activities must be completed and documented in compliance with all applicable Laws, including the Uniform Act, and the rules and regulations implementing the Uniform Act.

7.2.2 Software Requirements

DB Contractor shall employ software that is compatible with the software in use by TxDOT, or fully transferable to TxDOT's systems. DB Contractor must supply and maintain a Web-based, parcel-by-

parcel database that incorporates the fields and information required by TxDOT's approved ROW tracking system: ROWIS. DB Contractor must maintain and participate in any other required ROW tracking system required by the DBA Documents or otherwise agreed to by the parties. The database shall be fully accessible to Persons authorized by TxDOT.

7.2.3 ROW Acquisition Plan

DB Contractor shall prepare a ROW Acquisition Plan in accordance with the requirements of this Section 7 and Section 2 (Project Management). The ROW Acquisition Plan shall set forth DB Contractor's organization including names, titles and qualifications of Key Personnel and other Project ROW personnel, integration of the Project ROW schedule into the Project Schedule, interface between design and Project ROW activities, documentation and reporting, quality control procedures and quality review standards.

The ROW Acquisition Plan shall contain, as a minimum, the following:

a) The name of TxDOT approved title company(ies) to be used for title services

b) The name and qualifications of the proposed ROW Acquisition Manager (ROW AM)

c) The resumes and qualifications for appraisers, appraisal reviewers, land planners, relocation agents, negotiators, real estate attorneys, eminent domain specialist and ROW personnel who shall have the minimum qualifications and experience specified in Section 7.2.7

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

a) Provide sufficient personnel to achieve, in accordance with the Project Schedule, the goals and milestones established for Project ROW acquisition, relocation assistance, appraisals and appraisal review, and clearance/demolition of the improvements from the Project ROW.

b) Provide administrative support.

c) Provide for Spanish translation, visually impaired, or hearing impaired translation, as necessary.

d) Provide documentation and reports.

e) Produce and distribute acquisition and relocation brochures as approved by TxDOT.

f) Establish, implement, and maintain quality control procedures and quality review standards for the acquisition for Project ROW.

g) Prevent fraud, waste, and mismanagement.

DB Contractor shall update the ROW Acquisition Plan regularly, at least quarterly, in accordance with the DBA Documents.

7.2.4 Schedule and Review Procedures

The Project Schedule shall indicate the date to begin the acquisition of the Project ROW and the anticipated completion date of acquisition activities for each parcel. TxDOT shall be advised of all Additional Properties and temporary rights or interests in real property to be acquired by DB Contractor. In developing the Project Schedule, DB Contractor will give priority to the acquisition of parcels that have significant impact on the Project Schedule and/or affect the Critical Path as so indicated. The monthly status reports required by Section 2.1.1 shall provide updated projections for the acquisition date of each parcel.

In developing the Project Schedule, DB Contractor shall incorporate adequate time periods for TxDOT review and approval of Acquisition Packages. TxDOT intends to review the completed Acquisition Packages as expeditiously as possible; however, for the purposes of the Project Schedule, DB Contractor shall assume that the reviews performed by TxDOT will require ten (10) Business Days for Acquisition

Packages that DB Contractor submits as final and complete in accordance with Section 7.3.6 (Project ROW Acquisition Package Approval), up to a maximum of ten (10) Acquisition Packages. Any Submittals that would require TxDOT to review more than ten (10) Acquisition Packages within any given ten (10) Business Day period shall be considered excess, and TxDOT may defer its review of any such Acquisition Packages to a subsequent ten (10) Business Day period (or periods as necessary). TxDOT will notify DB Contractor of its election to defer any excess Acquisition Packages within ten (10) Business Days after receipt. The balance of Acquisition Packages in excess of ten (10) will be rolled over to the next ten (10) Business Day period and added to the Acquisition Package Submittals made by DB Contractor in that period. When DB Contractor submits more than ten (10) Acquisition Packages at any given time, DB Contractor shall indicate the priority of review.

If TxDOT notifies DB Contractor that any submitted Acquisition Package has a deficiency, DB Contractor shall correct such deficiency and resubmit the package to TxDOT. Resubmissions shall be treated as a new Acquisition Package as described above. An Acquisition Package shall be deficient, as determined by TxDOT, if any of its components fails to meet any of the criteria established by this section for such component, or contains any material errors or omissions. Schedule delays resulting from inadequate or incomplete submissions of Acquisition Packages shall be the responsibility of DB Contractor and will not be eligible for treatment as a Change Order.

TxDOT reserves the right to undertake additional review on Acquisition Packages 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 Business Days before rendering a decision to DB Contractor.

DB Contractor may request TxDOT to do a preliminary review of the survey and appraisal before the complete Acquisition Package is submitted. TxDOT shall review the preliminary submission of the survey and appraisal and notify DB Contractor of any deficiencies within ten Business Days after TxDOT's receipt of such preliminary submission.

7.2.5 DB Contractor's Project ROW Scope of Services

DB Contractor shall complete all administrative activities and prepare all documentation sufficient for DB Contractor to acquire the Project ROW. DB Contractor shall obtain TxDOT's review and prior written approval of all Project ROW maps and surveys, appraisals, legal descriptions, acquisition documentation, purchase price, requests to acquire Project ROW, condemnation-related activities, and funding/closing procedures. TxDOT will (i) approve and return the Project ROW acquisition documentation, (ii) provide review comments for incorporation by DB Contractor in accordance with Section 7.2.4 (Schedule and Review Procedures), or (iii) in the case of an Acquisition Package that is deficient, notify DB Contractor of the deficiency(ies) to be corrected by DB Contractor in accordance with Section 7.2.4 (Schedule and Review Procedures). Except as otherwise authorized by applicable State and federal policy and regulations for early acquisition and approved by TxDOT, DB Contractor shall not proceed with acquisition of the Project ROW until 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 purchase price, acceptable to TxDOT, TxDOT will commence acquisition of the property through eminent domain procedures. DB Contractor shall not be permitted to commence any condemnation action through the statutory "Declaration of Taking" procedure without the express written consent of TxDOT. Consent may be withheld in TxDOT's sole and absolute discretion.

DB Contractor shall not begin construction on any parcel of real estate unless property rights for the parcel have been conveyed and recorded in favor of TxDOT, possession has been obtained through eminent domain or any other method as provided for in Section 7.2.1 (Standards), or a Possession and Use Agreement has been validly executed and delivered by all necessary parties in accordance with Section 7.4.1 (Project ROW Negotiations).

7.2.6 Acquisition Process Summary

DB Contractor's major activities with respect to the acquisition of the Project ROW include:

a) Project ROW surveying and mapping

b) Project ROW budget estimates and updates

c) Title services

d) Appraisal services

e) Appraisal review

f) Negotiations

g) Closing services

h) Relocation assistance

i) Condemnation support services

j) Clearance and demolition of Project ROW

k) Environmental due diligence

l) Documentation and document control

m) Progress reports

n) Project ROW administration and management

o) Project ROW quality management

p) Letter from DB Contractor's design engineer certifying that the required Project ROW acquisition is necessary and that any proposed alternatives are not feasible or are cost prohibitive

q) Obtaining rights of entry, as necessary

7.2.7 ROW Personnel Qualifications

DB Contractor's ROW Acquisition Manager shall have at least five years of experience managing the acquisition of transportation ROW projects for a condemning authority, be licensed as a real estate salesman or broker pursuant to the *Texas Real Estate License Act* or rules established by the Texas Real Estate Commission, be familiar with appraisal and appraisal report review pursuant to the Uniform Standards of Professional Appraisal Practice (USPAP), and be familiar with the Uniform Act and applicable Laws of the State of Texas.

Quality Control Specialist(s) – DB Contractor shall designate a specific person(s) responsible for internal quality control and quality assurance. This individual will review all DB Contractor deliverables associated with survey, title, appraisal, acquisition, relocation and eminent domain prior to the deliverable being delivered to TxDOT for review.

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 years of 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 years immediately preceding his or her selection for this Project in appraisal work primarily in Bexar County, or as approved 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 samples of previous appraisal work prepared for eminent domain purposes. All appraisers preparing and signing appraisals must be approved by TxDOT before performing any appraisals on the Project. If required by TxDOT, the appraiser will be required to demonstrate his/her skills at expert witness testimony.

Land Planner - Each land planner shall have a minimum of five years of 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 years immediately preceding his or her selection for this Project in land planning work primarily in Bexar County, or as approved by TxDOT. DB Contractor shall provide a minimum of two land planners to assist appraisers and complete land plans.

Relocation Agent - Each relocation agent shall have a minimum of three years of experience in relocation assistance for ROW projects pursuant to the Uniform Act. A relocation agent's responsibilities shall include the following: Determination of eligibility of all displacees, contacting all displacees and informing them of their benefits, maintaining a file of all documentation concerning the relocation of the displacees, and extending all relocation assistance advisory services.

Negotiator - Each ROW negotiator shall be licensed either as a real estate sales person or broker pursuant to the *Texas Real Estate License Act* or rules established by the Texas Real Estate Commission, and shall be familiar with appraisal and appraisal report review pursuant to the USPAP. The negotiator shall have a minimum of three years of experience in right of way 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 3 years of 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 RTE-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 years of 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 years of experience in title review and curative matters. ROW personnel's responsibilities shall include, but not be limited to the following: maintain complete and accurate files of all transactions and contacts with the property owners and/or their representatives, coordinate and clear all title issues and assist at closing the properties acquired for the Project.

7.2.8 DB Contractor Conflict of Interest

If at any time, DB Contractor or to the best of DB Contractor's knowledge, any DB Contractor-Related Entity directly or indirectly (i) acquires or has previously acquired any interest in real property likely to be parcels of the Project ROW or the remainders of any such parcels; (ii) loans or has previously loaned money to any interest holder in any real property likely to be a Project ROW parcel and accepts as security for such loan the parcel, or the remainder of any such parcel that is not a whole acquisition, or

(iii) purchases or has previously purchased from an existing mortgagee the mortgage instrument that secures an existing loan against real property likely to be a Project ROW parcel, or the remainder of any such parcel, DB Contractor shall promptly disclose the same to TxDOT. In the case of acquisitions, loans or mortgage purchases that occurred prior to the execution of the DBA, such disclosure shall be made within ten days after execution of the DBA.

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 to all attendees for review and comment. Minutes will not be finalized until all attendees agree on content. Meeting minutes shall be provided 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. Proposed agendas shall be provided three (3) Business Days prior to the 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) Highway Designation

d) Project limits

e) Parcel number

f) Name of record owner(s)

In administering and managing its Project ROW activities, DB Contractor shall:

a) Maintain parcel records on file of all aspects of the acquisition process in accordance with TxDOT requirements and applicable Law. Each parcel file shall include all documents required by the DBA Documents, the FHWA, and/or TxDOT.

b) Provide monthly summaries for the cost of Project ROW acquisition and related relocation assistance including amounts authorized and amounts paid on a parcel-by-parcel basis and budget forecasting on an overall Project basis as requested by TxDOT.

c) Maintain and electronically transmit to TxDOT, in a format acceptable to TxDOT, monthly status reports including appraisal, acquisition and relocation status of all parcels and activities related to Project ROW, acquisition and disposition of Additional Properties and acquisition and disposition of temporary easements or other property interests, and provide weekly (or as requested) updates to TxDOT.

d) Evaluate and report to TxDOT, Subcontractor status and performance on a monthly basis or more frequently as requested.

e) Prepare and submit electronically to TxDOT, on a monthly basis, a spreadsheet that contains Project ROW specific data required in order to complete the fields in TxDOT's ROWIS tracking software program or as directed by TxDOT.

f) 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 DBA 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, procurement of title insurance, clearing of title, closing of acquisitions, condemnation support including expert witnesses required by TxDOT and/or the Attorney General's Office for all condemnation proceedings through special commissioner's hearings. The DB Contractor shall also be responsible for all exhibits, transcripts, and photos associated with condemnation services and proceedings required by the Attorney General's Office through special commissioner's hearings through jury trials and appeals, relocation assistance, and clearance/demolition of improvements, as required.

DB Contractor shall not contact the Attorney General's Office 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 the Project ROW costs shown in the Base Case Financial Model and any Base Case Financial Model Updates, and DB Contractor shall concurrently, with conveyance of the real property interest to the State of Texas, and without the necessity of further documentation executed by the State, obtain the rights to said saleable improvements. DB Contractor shall not be entitled to a credit for any improvements retained by a property owner. Upon conveyance of the real property interest to the State of Texas, DB Contractor shall comply with all applicable Laws with respect to relocation assistance and demolition.

DB Contractor shall also be responsible for the costs of acquisition and documentation for the acquisition of any temporary right or interest in real property not necessary for the Project but that DB Contractor deems advisable to acquire for work space, contractor lay-down areas, material storage areas, borrow sites, or any other convenience of DB Contractor. Except as otherwise authorized by Law for temporary areas necessary for construction of the Project, TxDOT shall not be obligated to exercise its power of eminent domain in connection with DB Contractor's acquisition of any such temporary right or interest, and TxDOT shall have no obligations or responsibilities with respect to the acquisition, maintenance or disposition of such temporary rights or interests.

DB Contractor shall pay the cost of, and shall be responsible for processing and issuing 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 (including the purchase price of Project ROW for drainage and other required easements); and temporary easements or other interests in real property acquired for the Project.

DB Contractor is responsible for the payment of all closing costs associated with the purchase of Project ROW in accordance with the Uniform Act and TxDOT policies.

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, relocation assistance payments, administrative settlement requests, negotiated settlement requests, court settlement requests, payments, and other approvals required by the DBA Documents, by the State, or by applicable Law within ten (10) Business Days after receipt of complete Acquisition Packages from DB Contractor.

b) After receiving a complete condemnation packet from DB Contractor in accordance with Section 7.4.4, 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 before the Commission's required deadline for eminent domain minute order requests.

c) TxDOT shall endeavor to reasonably accommodate a written request from DB Contractor for early submission to the agenda of the Texas Transportation Commission. TxDOT will coordinate with the Office of the Attorney General to provide legal counsel to prepare and deliver to TxDOT the condemnation petition within twenty (20) Business Days after the Attorney General's receipt of the condemnation packet, including Commission minute order approval. TxDOT will deliver the condemnation petition to DB Contractor within ten (10) Business Days after receipt of the condemnation petition from the Office of the Attorney General.

d) TxDOT will provide all coordination services between DB Contractor and the Office of the Attorney General for prosecution of jury trials.

e) TxDOT will provide a ROW Administrator to serve as first point of contact for all Project ROW issues as set forth in 23 CFR § 710.313(d).

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) Coordination with TxDOT on all legal matters concerning acquisition processes, including negotiated settlements

d) Analysis of recommended parcel values and/or appraisal issues

e) Additional legal advice and opinions as needed by TxDOT

f) Special commissioners’ hearings

g) Jury trials including determination of expert witnesses and all appeals

h) 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 all Project ROW documents in accordance with applicable TxDOT Standards, including the TxDOT *Right of Way Manual*, the TxDOT *Survey Manual*, and the TxDOT *GPS Users Manual*. 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 fifteen (15) Business Days for review of each submitted ROW map, each containing up to a maximum of 20 parcels. Any submittals that would require TxDOT to review more than 20 parcels within any given fifteen (15) Business Day period shall be considered excess, and TxDOT may defer its review of any such excess parcels to a subsequent fifteen (15) Business Day period (or periods as necessary).

DB Contractor shall assemble an Acquisition Survey Document Package and deliver to TxDOT upon request of preliminary and/or final review. The Acquisition Survey Document Package shall include:

a) Three half size right of way maps on paper, Scale 1”= 100’ (11”X 17”).

b) One separate set of Originals signed and sealed by RPLS, legal and sketch, traverse closure sheet and a copy of the parent track deed and subdivision plat if tract is a platted lot.

c) Create CD with DGN Master File, Map Sheets, Excel Point List and Raw Data File and/or Field Notes.

d) One full size right of way map on paper, Scale 1” = 50’ (22”x34”).

e) One set of folders for each parcel, Parts 1 & 2, etc., would be considered one folder. With one (copy signed and sealed) legal description, sketch, closure sheet, parent tract deed and subdivision plat if tract is a platted lot (and bi-section if applicable) secured inside on the right side.

f) Three copies (signed and sealed) of each legal and sketch.

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

a) DB Contractor shall assemble an Acquisition Survey Document Package. The Acquisition Survey Document Package shall include the Project ROW map, a parcel (metes and bounds) description, and a parcel plat, with a closure report for each of these three items for each of the parcels to be acquired. The latter three items shall be on standard 8½” x 11” bond paper. The Project ROW map sheets shall be on 22” x 34” paper. Each final submission to TxDOT shall include two sets of each document, unless otherwise directed. Each map sheet and document page shall have an "as of" date near the lower right hand corner. The parcel plat and parcel description for a given parcel should show identical “as of” dates.

b) The Parcel, as shown on the ROW map sheet and plat, shall show all areas of denied access according to the current TxDOT *Access Control Management Manual*.

c) The point of beginning (POB) shall be located on the proposed Project ROW line and shown in all documents with its centerline (survey baseline) station and offset.

d) The point of commencing (POC), where applicable, shall be a well-defined monument, and shall be tied to the POB by measured bearing and distance. The POC shall not be located on any proposed Project ROW line, or existing Project ROW line within the proposed Project ROW.

e) The centerline (survey baseline) station and offset shall be shown on the Project ROW map sheets for all significant points along the Project ROW line such as point of curvature (PC), point of tangency (PT), point of intersection (PI), point of compound curvature (PCC), and point of reverse curvature (PRC), and for property line intersections (PLI) with the Project ROW line, and for any other monumentation points on the Project ROW line.

f) The centerline (survey baseline) station and offset shall be shown in the parcel description and parcel plat at the beginning and ending, being the points with the lowest station and the highest station, of each parcel along the proposed Project ROW line.

g) Project ROW map sheets shall include all curve data, with the station and coordinates of the PI, and the stations at each end (PC, PT, PRC, PCC), for every centerline (survey baseline) curve on that map sheet.

h) Any existing ROW lines being incorporated into the proposed Project ROW, including intersecting rights of way, shall be surveyed and monumented (if not previously monumented).

i) All Project ROW maps (and on the title sheet) and all parcel descriptions (at the end of the description) shall include a notation that identifies the State Plane Coordinate System and UTM zones, datum (NAD83) (HARN) (2002), and the Project grid-to-surface coordinate adjustment factor.

j) A Project ROW map title sheet with signature blocks shall be produced for each portion of the Project. DB Contractor shall sign the Project ROW map.

k) All Project ROW maps shall include a control sheet (or sheets), to show the primary survey control points with their location relative to the Project.

l) The parcel description and parcel plat documents shall all be referenced as parts of the exhibit recorded with the deed, so the pages shall be numbered accordingly. For example, if the parcel description is two pages, the parcel plat is one page, then the first page of the parcel description is denoted “Page 1 of 3”, the parcel plat is denoted “Page 3 of 3”.

m) Improvements within 100 feet outside of all proposed Project ROW shall be depicted on the Project ROW map sheets. All improvements should be current as of the date of the on-the-ground property survey.

n) All visible improvements (buildings and structures) within 25 feet outside of the proposed Project ROW line shall be located by an “on-the-ground” survey and documented on the Project ROW map sheets and the parcel plats by measured offset distance from the proposed Project ROW line. Clearly indicate which distances are surveyed on–the-ground.

o) Calculated points shall be shown by a symbol on the drawing, with their relationship to the found reference points.

p) All property, city, county, abstract, section, and survey lines shall be indicated appropriately. A map legend should clearly define the line styles and symbols used.

q) Upon final submittal from DB Contractor of the Project ROW documents to TxDOT, DB Contractor shall cause the surveyor to mark on the ground, using permanent and stable monuments as defined in Section 663.17 of the General Rules of Procedures and Practices of the Texas Board of Professional Land Surveying (TBPLS), all significant points along the Project ROW line, as described above, and all property line intersections with the Project ROW line.

TxDOT requires these monuments to be a ½-inch iron rod, driven just below surface level, capped by a TxDOT-labeled aluminum cap (rod-and-cap monument).

r) Prior to acceptance of the ROW maps and surveys by TxDOT, DB Contractor shall cause a TxDOT Type II monument to be set at all significant points on the Project ROW line and at intersections with existing Project ROW lines, replacing monuments as described above (construct according to TxDOT specifications), unless otherwise directed by TxDOT.

s) 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, unless directed by TxDOT. Project ROW line intersections with property lines shall remain monumented by a ½-inch iron rod with a TxDOT aluminum cap (rod-and –cap monument).To reference all significant points along the centerline (survey baseline), DB Contractor shall set a rod-and-cap monument; and upon completion of the Project ROW acquisition or as directed by TxDOT, DB Contractor shall replace it with a TxDOT Type II monument, on the final Project ROW lines, perpendicularly left and right of each significant centerline point, regardless of the relative orientation of the final Project ROW line.

t) For any required revisions, DB Contractor shall resubmit to TxDOT all documents pertaining to the parcel to reflect the most recent revision date, and shall add a notation on the appropriate documents to state briefly the reason for the revision.

u) Documents shall contain deed references (survey name, abstract number, volume and page or document number, grantee, and area) for all existing public 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".

v) The documents produced by the surveyor are the property of TxDOT, and release of any document shall be subject to TxDOT's prior written approval.

w) DB Contractor shall cause the surveyor to include the denial of access line on the Project ROW map sheets and on the parcel plats, as required for controlled access facilities. DB Contractor also shall cause the surveyor to describe the area of denied access in the parcel description and monument on the ground with a ½" iron rod with orange cap stamped "TxDOT ADL" the limits of the denial of access.

x) The Project ROW map and each parcel plat shall include a parcel information table containing the areas, expressed in square feet, of the following: 1) the parent ownership as stated in all adjoining record vesting deeds or converted from the stated record acreage in those vesting deeds; 2) the parcel to be acquired as shown on the closure report for that parcel, and; 3) the remainder tract (item 1 minus item 2). If the parcel to be acquired consists of multiple parts, the Project ROW map shall show the net remainder. The parcel information table shall also contain the areas, expressed in acres, of the parent tract, the parcel to be acquired, and the remainder. This acreage (except stated record) shall be converted from the square footage as contained in the table. A note shall be included on the Project ROW map and on each parcel plat stating: "The acreage calculated and shown hereon is converted from the square footage shown hereon, and is for informational purposes only." Parcels with area less than one acre will not require acreage units to also be shown. All parcels, including parcels acquired by TxDOT or other Governmental Entity, shall be included on the Project ROW map.

y) Within the proposed Project ROW, all property owned by a city, county, or other local public agency (LPA) in fee or easement that does not have a vesting deed shall be identified by a parcel number and included on the Project ROW map. DB Contractor shall cause the surveyor to

prepare a parcel description and parcel plat for use as an exhibit in the Project ROW acquisition (property transfer) documents.

z) DB Contractor shall cause an independent Registered Professional Land Surveyor (RPLS) to review the Acquisition Survey Document Package for consistency as to the information delineated thereon and for compliance with all applicable Technical Provisions and survey documents. The boundary location and the survey methods remain the responsibility of DB Contractor, and are not part of this review process. TxDOT will have no obligation to accept the Acquisition Survey Document Package as complete until the reviewing RPLS has signed and sealed the compliance certificate (compliance certificate form to be provided by TxDOT).

aa) Parcel numbering shall follow the TxDOT *ROW Manual*. Parcels are to be numbered based upon the parent tract. DB Contractor shall revise parcel numbering due to subsequent transactions as in the following example: From a 50-acre parent tract, with a proposed Project ROW acquisition parcel identified as Parcel 14, a 5-acre tract is sold which will also require Project ROW acquisition. The result is, Parcel 14 is "Not Used", and the two new Project ROW acquisition parcels are identified as Parcel 14A and 14B. If the property containing Parcel 14B sells a portion, then 14B is "Not Used" and the new Project ROW acquisition parcels are identified as Parcel 14C and 14D, etc. DB Contractor shall not use the letter "E" to avoid confusion with easement designations. Parcel numbering shall be sensitive to the appraisal of the required parcels.

bb) Complicated portions of a Project ROW acquisition survey can cause the Project ROW Map to be very difficult to read. TxDOT's preferred solution is to create an additional Project ROW map sheet or sheets for details, curve data, general notes, etc. The primary page would still retain the whole property inset, record ownership data, and most of the usual information. The additional sheet(s) should be clearly referenced and be numbered as the next sequential page(s). Pages numbered with a letter added (for example: 6A, 6B) are for revisions and corrections. DB Contractor shall use the preferred solution unless TxDOT approves an alternate method.

cc) An ownership sheet or sheets, containing an index to the information for all the parcels, shall be included and located near the beginning of the Project ROW map, after the title sheet and control sheet. The ownership sheet index shall include the parcel numbers, the names of the property owners, the vesting deed recording information, the record area of the parent tract, the area of parcel(s) to be acquired, the area of the remainder(s) left and right, the beginning and ending stations of the parcel along the Project ROW line, and the sheet number in the Project ROW map where the parcel is located.

dd) At property corners where more than one monument is found, a detail shall be provided to show the measured relationship between the monuments found and the monument set or held.

ee) DB Contractor shall purchase all materials, supplies and all items necessary for proper survey monumentation. DB Contractor may purchase Type II monuments from TxDOT. TxDOT shall make available for pick-up by DB Contractor Type II monuments within 75 Days after TxDOT receives from DB Contractor a written order, specifying the number of monuments to be purchased. Payment for TxDOT-supplied monuments shall be due within 30 Days after TxDOT delivers to DB Contractor a written invoice. DB Contractor may use these monuments only for this Project and shall be responsible for proper storage thereof.

ff) DB Contractor at the request of the property owner or TxDOT shall re-stake the proposed ROW with ½" iron rod and aluminum cap.

gg) 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 the 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 over 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, including the following requirements:

a) Select and contract with one or more title companies approved by TxDOT and deliver to TxDOT a five-year sales history, a preliminary title commitment or preliminary title report, and, if necessary or appropriate, copies of all underlying documents and a plot of all easements, including Existing Utility Property Interests, referenced therein for each parcel (including fee acquisitions, slope easements, other drainage and roadway ROW or easements and abandonment of utility easements) to be acquired by TxDOT for the Project. Each title report shall be dated not more than 90 Days prior to the date of submittal to TxDOT of the Acquisition Package for such parcel. DB Contractor shall, at its own cost, review each title report to ensure that it complies with the format required by the DBA Documents. DB Contractor shall, at its own cost, retain the services of a real estate attorney, licensed and located in the State of Texas, to be available for title support and acquisition assistance. All title reports must be in the following required format: clearly indicate which exclusions and exceptions shall be deleted upon acquisition of the subject parcel, and clearly indicate any required deliverables to the title company to clear identified exclusions and exceptions. Title reports shall be in accordance with Good Industry Practice. DB Contractor shall notify the title company, by letter, which exceptions should be removed, including easements that (a) are appurtenant to and/or of benefit to the parcel but not included in the parcel to be acquired, and (b) are a burden on the parcel and not acceptable.

b) Review the preliminary title commitment or report to ensure that all current owners of record title are contacted and that negotiations or condemnation actions are conducted with all appropriate parties.

c) Work with the current owners of record title to each parcel or interest in a parcel or their designee and all other appropriate parties to clear any title exceptions or exclusions not acceptable to TxDOT.

d) Secure an owner's policy of title insurance in the amount of the total acquisition cost 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. DB

Contractor shall pay the applicable title company for the cost of the title policies, including all endorsements thereto required by TxDOT. 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 Department of Transportation."

7.3.4 Introduction to Property Owners

DB Contractor shall prepare and send out initial contact letters of introduction for both property owners and displacees. The letters shall clearly describe the Project, TxDOT's need for the owner's property, and shall include the name and telephone number of a DB Contractor's representative. TxDOT's ROW Administrator or his/her designee will sign the letters on TxDOT letterhead. The forms for these letters shall be approved by TxDOT prior to use. Property owners or displaces unable to read or understand the notice must be given appropriate translation.

DB Contractor shall prepare 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 Attorney General's Website, https://www.oag.state.tx.us/agency/Landowners_billofrights.pdf.

7.3.5 Appraisals

7.3.5.1 Appraisal Services

DB Contractor shall provide TxDOT with fair market value appraisals prepared by appraisers meeting the minimum qualifications established herein. All appraisals shall be 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:

1. Select appraisers from TxDOT's list of approved 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.
2. Establish personal pre-appraisal contact with each owner of record title and each occupant, and document all contacts utilizing forms provided by TxDOT.
3. If necessary, make a diligent effort to secure a written agreement between the record title owner and DB Contractor granting TxDOT, DB Contractor or assignees permission to enter the applicable parcel to be acquired (a "Right of Entry Agreement"). DB Contractor may at its sole discretion and expense offer to pay reasonable compensation for any required Right of Entry Agreements. If DB Contractor, after best efforts, is unable to secure a Right of Entry Agreement from the property owner, DB Contractor shall provide documentation acceptable to TxDOT indicating conversations, correspondence, and efforts used to attempt to secure the Right of Entry Agreement.
4. 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 in the parcel file.
5. Cause the appraiser to prepare a complete appraisal report for each parcel to be acquired to include the whole property, the portion to be acquired, and any damage to the remainder. It shall also include all improvements on the whole property, unless otherwise directed by TxDOT. The appraisal reports shall comply with and include all matters required by this section and TxDOT ROW related manuals, and shall satisfy the requirements of the USPAP in effect at the time the appraisal is submitted. Special analyses, studies or reports, as necessary, shall be made a part of each appraisal. The appraiser must use the most current edition of the standards referenced above

and continually monitor these standards to ensure the appraisals conform to the most current requirements of professional appraisal practice. All appraisals shall utilize TxDOT Form ROW-A-5 - Real Estate Appraisal Report unless otherwise authorized by the TxDOT *Right of Way Manual* or TxDOT *Appraisal and Review Manual*; however, all appraisals for condemnation proceedings shall utilize TxDOT Form ROW-A-5 - Real Estate Appraisal Report.

6. Obtain and provide TxDOT with copies of all written leases, licenses and other occupancy agreements, including outdoor advertising/sign agreements, 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.

7. Perform an evaluation of all outdoor advertising signs, as required, utilizing the appropriate forms as instructed by TxDOT.

8. Cause the appraiser(s) to testify as an expert witness(es) or provide expert witness(es) approved by TxDOT in special commissioners' hearings or eminent domain proceedings through jury trial and be available for depositions, other discovery, pre-hearing or pre-trial meetings and appeals, as directed by TxDOT. DB Contractor shall also provide administrative and/or technical support for such proceedings as requested by TxDOT.

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

10. Cause a report to be prepared by an environmental professional that meets ASTM E-1527-05, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process, or provide a report in a manner approved by TxDOT, documenting the environmental condition of each parcel, which may be based on field investigations and/or historical review, as appropriate for the particular parcel. The report shall be completed in coordination with the appraiser(s) and shall be available to the appraiser(s). A Phase I environmental site assessment or a report provided in a manner approved by TxDOT shall be performed for all properties. If it is determined that there is a potential environmental risk based on the Phase I report or other report then a Phase II investigation shall be performed. 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. 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.

11. Engage the services of, and cause, a land planner to perform, or otherwise assist in the preparation of, any and all appraisals that involve a parcel with a valuation analysis indicating a highest and best use that is other than the current use of such parcel, or as directed by TxDOT for certain other appraisals. DB Contractor shall notify TxDOT in writing of each and every instance when the highest and best use of a parcel is different and TxDOT will determine to what degree land planner services will be utilized by DB Contractor.

12. Cause the appraiser(s) to prepare updated appraisals, as well as updated appraisal reviews, when required by TxDOT or as needed during eminent domain proceedings. An updated appraisal package shall comply with USPAP, specifically the Statement on Appraisal Standards No. 7 (SMT-7) and Advisory Opinion, AO-3. The term "Update of an Appraisal" is defined as "an extension of a complete or limited appraisal and report relied on by a client for a prior business decision." At a minimum, the updated appraisal report must include:

    - A letter of transmittal with a specific reference to the original appraisal report, any changes in market conditions, since the original appraisal, any changes in the subject property since the

original appraisal, a statement of the current value or extension of the original value opinion and the listing of the current date of value.

- An updated Page 1 from TxDOT Form ROW-A-5 – Real Estate Appraisal Report or Form ROW-A-6 – Real Estate Appraisal Report, as appropriate, with the current date of a recent inspection of the subject property and a current date of value. This form needs to have a current signature and date by both the appraiser and the reviewing appraiser in the appropriate spaces on the form.
- Any qualifying and limiting conditions or general assumptions by the appraiser shall be clearly stated and attached.
- A copy of the survey and legal description of the property being acquired, current photographs of the subject property, clearly showing the area being acquired, even though the original appraisal report contained photographs of the subject and the area of the acquisition. If there are significant changes to the subject property, the area being acquired, access to the remainder property, damages to the remainder(s), market conditions, the subject property's highest and best use from the previous appraisal or significant changes in the approaches to value, the property shall be reappraised using either TxDOT Form ROW-A-5 – Real Estate Appraisal Report, or, when approved by TxDOT, TxDOT Form ROW-A-6 – Real Estate Appraisal Report, depending on the report used for the original appraisal. Appraisers shall refer to Sections 6.03 and 6.04 of the TxDOT *Appraisal & Review Manual* for additional guidance. DB Contractor shall follow these guidelines in producing updated appraisal reports and shall discuss specific updating requirements for any complex appraisals with TxDOT before beginning the assignment.

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

14. Complete and furnish, to the appraiser, TxDOT Form ROW-A-9 - Property Classification Agreement before appraisal is completed.

7.3.5.2 Appraisal Review

In connection with appraisal review, DB Contractor shall:

1. Select review appraisers from TxDOT's list of approved fee appraisers and meeting the requirements of Section 7.2.7. The review appraiser selected must follow the appraisal guidelines and procedures found in Chapter 4 of the TxDOT *ROW Appraisal & Review Manual*.

2. Determine, in consultation with TxDOT, if additional appraisal reports or technical expert reports are required. Initiate, review, and reconcile each report required.

3. Review all appraisal reports for each parcel to determine consistency of methodology, supporting documentation related to the conclusion reached, and compliance with TxDOT standards, as defined in Section 7.3.5.1 (Appraisal Services) and this Section 7.3.5.2 (Appraisal Review), the TxDOT *ROW Appraisal & Review Manua*l, the *Uniform Appraisal Standards and Federal Land Acquisitions* and the requirements of the Appraisal Foundation's USPAP in effect at the time the appraisal is reviewed. The review appraiser must use the most current edition of the standards referenced above and continually monitor these standards to ensure the appraisals conform to the most current requirement of professional appraisal practice.

4. Inspect the subject properties and the sale properties used in direct comparison for each appraisal being reviewed.

5. Upon completion of the review outlined above, the appraiser shall certify in writing to TxDOT that all required standards have been met. This certification will occur by signing on Page 1 of each TxDOT Form ROW-A-5 (Real Estate Appraisal Report) or TxDOT Form ROW-A-6 (Real

Estate Appraisal Report) in the block provided. The review appraiser will also complete TxDOT Form ROW-A-10 (Tabulation of Values) to accompany each appraisal.

6. For appraisal updates, the review appraiser shall perform a complete review of the updated appraisal, re-inspecting the subject property and the sales used, as of the current date of value. The review appraiser shall follow the procedures outlined in the TxDOT *ROW Appraisal and Review Manual*. A new TxDOT Form ROW-A-10 (Tabulation of Values) will be required for each updated appraisal ordered by DB Contractor.

7. In accordance with providing a Quality Control Specialist(s) as stated in Section 7.2.7, ensure that appraisal consistency and quality for the entire project is monitored for project-wide controls and consistency.

7.3.6 Project ROW Acquisition Package Approval

Acquisition Packages submitted by DB Contractor for TxDOT's approval shall include the following items, prepared for each parcel in accordance with the requirements of this section:

1. A cover sheet setting forth the following information for each parcel.
   - Parcel number and number of parts
   - Station number
   - CSJ number
   - Location of parcel
   - Name of owner
   - County and/or other jurisdiction
   - Extent of acquisition (partial or whole acquisition)
   - Type of conveyance (fee, easement, etc.)
2. 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.
3. 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.
4. 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.
5. A copy of the appraisal report with an effective date less than 180 Days and all supporting documentation.
6. A copy of the environmental site assessment and all amendments as described in Section 7.3.5.1 (Appraisal Services).
7. A real/personal property report detailing what items making up each parcel are classified as real estate, tenant-owned improvements or personal property. Particular attention shall be paid to items that have questionable classifications. A completed TxDOT Form ROW-A-9 (Property Classification Agreement).
8. 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 and regulations.

9. 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.

10. 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 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 offer. All appraisal reports produced or acquired by TxDOT relating specifically to the property owner's property and prepared in the 10 years preceding the date of the offer must also be delivered to the property owner. DB Contractor shall also maintain a file record of receipt of appraisal signed by the property owner. DB Contractor shall also maintain follow-up contacts and secure the necessary documentation and title curative Work upon acceptance of the purchase offer.

b) At the time of offer, produce and distribute to all property owners and displacees, TxDOT-approved informational brochures, as appropriate. The ROW brochures shall be purchased by DB Contractor and shall include language about the use of the *Declaration of Taking* procedure if DB Contractor anticipates requesting the utilization of this procedure by TxDOT anywhere within the Project.

c) Identify lessees, licensees, occupants, or other parties with potential compensable interests including outdoor advertising sign owners, and, if appropriate, after consultation with TxDOT, negotiate with such parties for the acquisition of their compensable interests.

d) Advise the property owners, lessee, 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. DB Contractor and TxDOT shall jointly determine whether to accept a

settlement request. Delivery of the administrative settlement request and DB Contractor's recommendation to TxDOT must occur within fifteen (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 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 Business Days after receipt. If this delivery method is not feasible, DB Contractor shall mail (return receipt requested) response letters not more than three Business Days following any decision by the TxDOT Administrative Settlement Committee. If DB Contractor selects the mailing option, DB Contractor shall make a telephone call to the property owner to discuss the settlement offer prior to mailing the response letter. The TxDOT ROW Administrator, on an as-needed basis, will convene the TxDOT Administrative Settlement Committee.

g) Notwithstanding an unsuccessful completion of the formal administrative settlement process, DB Contractor may, in its sole discretion, 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 Business Days after inquiry) response to the verbal or written inquiries of any property owner, lessee, licensee, occupant or other holder of a compensable interest, as applicable.

i) Prepare a separate negotiator contact report for each meeting or conversation with any person (or their appointed representative(s) supported by a written confirmation of appointment) who has a compensable interest in each parcel on TxDOT Form ROW-N-94 – Negotiator's Report. Contact reports shall also be prepared for unsuccessful attempts to contact such persons.

j) Maintain a complete parcel file for each parcel. All original documentation related to the purchase of the real property interests will be maintained (housed separately from the relocation files) in conformance with TxDOT standards, manuals, and procedures, as defined in Section 7.2. All original Project ROW documents must be retained and properly secured in DB Contractor's Project office or as otherwise approved by TxDOT. Signed original documents shall be forwarded to TxDOT periodically or as requested by TxDOT with a transmittal form during the acquisition process; provided, however, that all remaining original documents shall be forwarded upon completion of the acquisition of Project ROW for the Project.

k) Prepare and deliver documents of conveyance (including bisection clause and access clause, if applicable) to the property owner, lessee, licensee, occupant, or other holder of any compensable interest, as applicable, and obtain their execution of the same. All signatures on documents to be recorded shall be notarized in accordance with Texas law.

l) Pursue and obtain Possession and Use Agreements (PUA) concurrently with the parcel negotiations. The form of PUA will be provided by TxDOT and will contain provisions allowing for construction to commence while negotiations are finalized. Such agreements will be sought and negotiated by DB Contractor strictly in accordance with the Law and only with the prior written consent of TxDOT. If DB Contractor exercises the use of a TxDOT PUA, DB Contractor

must obtain a deed or commence action on condemnation proceedings by forwarding a condemnation packet to TxDOT for approval within six months from the date of the PUA.

m) Be open to all reasonable settlement requests (that comply with the regulations as outlined in this section) from the property owners, which are feasible and help expedite the Project ROW acquisition process. DB Contractor acknowledges and understands that TxDOT encourages all positive and creative solutions which satisfy the property owner and promote the success of the Project.

n) DB Contractor shall repair 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 fourteen (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 days after delivery to the property owner.

If the offer 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 from Project ROW. 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 the DBA Documents.

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).
2. Monitor relocation assistance activities.
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:

1. 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 displaces. DB Contractor shall maintain a written record of all verbal contacts.
2. 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.
3. Contact and provide relocation assistance to those parties affected by the Project ROW acquisition and complete forms for all displacees, as required.

4. Locate, evaluate and maintain files on comparable available housing, commercial, retail, and industrial sites.
5. Calculate replacement supplement benefits.
6. 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.
7. Perform a Decent, Safe and Sanitary (DSS) inspection for each replacement housing comparable, photograph the comparable and complete the DSS inspection form, TxDOT Form ROW-R116 (Replacement Housing Inspection).
8. Request at least two moving estimates from moving companies to effect relocation of personal property or consistent with the Uniform Act.
9. Prepare moving plan with appropriate photos, sketches and inventory of personal property to be moved.
10. Coordinate moves with displacees and moving companies in accordance with TxDOT standards and the Uniform Relocation Act.
11. Maintain relocation contact logs on a TxDOT Form ROW-R96-R (Relocation Advisory Assistance – Parcel Record).
12. Attend all closings on replacement properties, if requested by any party involved, and assure supplemental payments, if any, are properly distributed.
13. Process and compute increased interest payments on the mortgage of owner-occupied dwellings, as required.
14. Deliver to displacees a 90 Day notice of eligibility letter simultaneous with the delivery of the relocation benefits package. Deliver a 90 Day letter to displacees with the location of the comparable property used to compute the supplement.
15. Deliver a 30 Day notice to displacees and property owners upon acquisition of Project ROW.
16. Notify TxDOT's ROW Administrator office immediately if a displacee has not moved after 30 Day notice expires. Prepare a written recommendation to facilitate the displacee's move.
17. Be available for any appeals or hearings.
18. Prepare relocation payment claim submissions for all displacees and all relocation assistance benefits.
19. Verify DSS dwelling criteria on all replacement housing as selected by the displacees.
20. Secure dwellings and structures no later than ten Days after vacancy and protect the Project ROW following acquisition and relocation.
21. Maintain a complete file, separate from acquisition files, on each displacee and make available for inspection.
22. 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 Attorney General’s office for eminent domain also has a relocation issue.
23. 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 specialist.

24. Deliver to each displacee the relocation assistance payments according to the TxDOT *Right of Way Separation of Duties* chart provided.
25. Assist the Attorney General's office 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:

1. Submit a closing package to TxDOT for review a minimum of 24 hours prior to closing. The package shall include the following: a.) a reference to the disposition of any environmental matters; b) updated title commitment, no more than fifteen (15) Days prior, with notations indicating the disposition of all schedule "C" items; c) a copy of the executed warranty deed to be delivered; d) a proposed closing statement indicating disposition of all proceeds; e) a copy of any and all releases of liens; f) a copy of any miscellaneous documents and other curative matters required to be delivered at closing and g) a copy of the closing memorandum outlined in item 2 below.
2. 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.
3. 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.
4. Obtain an issued title policy based on the approved updated title commitment within 30 Days following closing and transmit the same to TxDOT.
5. Obtain and deliver to TxDOT one certified copy of each instrument of conveyance immediately after closing, and provide a copy of the title policy to TxDOT within five Business Days after receipt. Cause to be delivered to TxDOT a copy of the recorded deed within ten Days after the title company receives the recorded deed.

7.4.4 Condemnation Support

DB Contractor shall provide an individual or individuals having sufficient knowledge of the design of the Project to appear as an expert witness for testimony at the special commissioners' hearing or other proceedings. This individual(s) is also responsible for preparing exhibits as requested by TxDOT or the Office of the Attorney General in support of said testimony.

DB Contractor shall support condemnation efforts as directed by TxDOT and further delineated as follows:

1. Notify TxDOT of any potential condemnation and document the reason(s) for condemnation including recommendations for property closure.
2. Conduct all applicable eminent domain-condemnation activities in accordance with the policies and procedures as described in the TxDOT *Right of Way Manual*, Volume 4: "Eminent Domain "; in the TxDOT *ROW Appraisal and Review Manual*, Chapter 7 "Eminent Domain-State Acquisition" or as revised; and in Chapter 21, Texas Property Code and Senate Bill 18.
3. 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.

4. Provide to TxDOT, within ten Days following non-response or rejected certified mailing, notification thereof together with a signed and sealed parcel description and parcel plat, and a bisection clause and access clause, if necessary, with the clauses attached to a property exhibit containing the parcel description and parcel plat.
5. Use the information from the title report to join all parties having a property interest on applicable the TxDOT form. Spouses of property holders with compensable rights must also be joined.
6. Upon completion of TxDOT Form ROW-E49 (Request for Eminent Domain Proceedings), prepare a condemnation packet containing two copies each of the following documents: the completed TxDOT form, negotiation logs, the updated title report not more than 90 Days old, appraisal receipt acknowledgment, pre-appraisal contact sheet, signed and sealed field notes, parcel sketch, bisection clause and access clause exhibits (if necessary), initial offer letter and final offer letter reflecting latest appraisal, complete minute order request form (form to be provided by TxDOT), any correspondence sent by DB Contractor or from the owner of the compensable interest or representatives, one copy of the appraisal report not more than 180 Days old from the effective date of the appraisal report and evidence of a bona fide offer to the property owner. Submit two (2) complete condemnation packets to TxDOT's ROW Administrator for review and approval.
7. 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.
8. File the petition for condemnation with the appropriate court clerk after a determination that a timely settlement is not feasible. Send a copy of the petition, by certified mail, return receipt requested, to the owner, lessee, licensee, occupant or other holder of compensable interest.
9. Coordinate and provide legal and technical support to the Attorney General's office, as required to facilitate filing the petition, assignment of a court, and setting of a hearing date.
10. Make available to TxDOT on behalf of the Attorney General's office an agent who will be expected to assist in making arrangements for conferences with witnesses prior to trial, filing the condemnation petition, informing the Attorney General's office 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.
11. Depending on the market conditions or if over six months have elapsed since the date of the initial offer, contact the attorney handling the case for TxDOT and confer about the advisability of preparing an updated appraisal. If it is determined that an updated or new appraisal is necessary or desirable, obtain such appraisal using the same procedures as described in Section 7.3.5.1 (Appraisal Services) above. DB Contractor must also undertake appraisal review as described in Section 7.3.5.2 (Appraisal Review).
12. Coordinate with TxDOT on behalf of the Attorney General as to land planners and/or other expert witnesses as required by the Attorney General. DB Contractor, at its cost, shall provide the land planner or other expert at the request of TxDOT or the Attorney General. The land planner or other expert report, if required, shall be completed and forwarded to the appraiser before the updated appraisal is completed.
13. Appear or provide for the appearance of expert witness(es) or fact witness(es) when requested by TxDOT or the Attorney General's Office. The appearances may include pre-commissioner's hearing preparations, special commissioner's hearings, and subsequent proceedings including jury trials and related proceedings.

14. Submit the updated appraisal to TxDOT and the attorney handling the case for TxDOT for review and approval, which review and approval shall occur within ten Business Days of receiving the updated appraisal. TxDOT and DB Contractor must approve any revised offer in writing prior to an offer letter being sent. If a revised offer is approved, prepare a final offer letter, make the revised offer to the property owner or other holder of a compensable interest, as applicable, and submit a copy of the final offer letter to TxDOT for written approval.
15. Communicate with TxDOT as to the parcel status on a monthly basis and in the Project progress report or as requested by TxDOT.
16. Serve in person, a "Notice of Hearing" not later than twenty (2) Days before the date of the special commissioners' hearing or other hearings and notice requirements as directed or authorized by the court.
17. Call and send reminders letter two to three 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.
18. Upon completion of the hearing, prepare TxDOT Form ROW-E73 (Data Sheet – Special Commissioners 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.
19. 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 Contractors available to appear as an expert witness or fact witness, as requested at the special commissioners' hearing or subsequent proceedings. The selection of all expert witnesses to be used for jury trials shall be determined by the Attorney General's Office.
20. Schedule and pay for all court reporter services, transcription costs, expert witness fees, exhibits, and exhibit workbooks as directed by TxDOT.
21. Be responsible for coordinating the pre-hearing meeting with TxDOT on behalf of the Attorney General's office and all others required for testimony or exhibit preparation. DB Contractor shall require expert witnesses with all exhibits and documents to be present at a pre-hearing meeting.
22. 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 days after objections have been filed, DB Contractor, at its cost, shall order transcripts of such hearing.
23. DB Contractor shall provide an individual or individuals having sufficient knowledge of the design of the project to appear as an expert witness for testimony at the Special Commissioners Hearing or other proceedings. This individual(s) is also responsible for preparing exhibits as requested by TxDOT or the Office of the Attorney General in support of said testimony. Exhibits shall be left in the custody of TxDOT at the close of the hearing.

7.4.5 Clearance/Demolition of Project ROW

Prior to demolition of any improvements, DB Contractor shall provide to TxDOT, photographs of the property and all improvements, unless the special commissioner's hearing has been completed and objections have not been filed. DB Contractor shall also have photos of personal property and any other items of dispute in and of a quality suitable for presentation as evidence in court. Following acquisition or possession of any parcel of Project ROW, DB Contractor shall:

1. Within ten (10) Days from acquisition 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, and winterize as required by TxDOT or applicable Law.
2. Coordinate with the owner and occupants to assure the clearance of personal property from the Project ROW, as applicable.
3. Provide for any insect and rodent control and initiate extermination as required to protect the adjacent properties and rid the Project ROW from infestations.
4. Secure Governmental Approvals required for demolition and environmental surveys or tests, and notify TxDOT in writing of all such activities.
5. To the extent required by Section 7.2.11 (DB Contractor Responsibility for Costs), prepare necessary documentation for disposal of improvements, fixtures and buildings in accordance with applicable Laws and submit the same to TxDOT.
6. 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.
7. Terminate all utility service(s) when appropriate.
8. 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.
9. Demolish and/or remove all improvements.
10. Notify TxDOT upon completion of the demolition and clearance of the Project ROW, as applicable.

7.4.6 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 DBA Documents and referenced standards.

7.4.6.1 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, at a minimum, construct a 6-foot-high chain-link fence with metal posts. DB Contractor shall use Good Industry Practice in fencing public properties to control public access to the Project.

7.4.6.2 Property Fencing for Private Properties

DB Contractor shall instruct the appraiser to use the "Cost to Cure" format to compensate an owner of private property for a replacement fence when the Project ROW line leaves one or more unfenced

remainder property(s) that were fenced before the taking. Compensation for the new fencing will be based upon the same type of fence as the property owner's existing fence.

When the property owner is paid through the appraisal process for the cost to rebuild the fence on the remainder property, DB Contractor shall include in the memorandum of agreement or the purchase agreement for such property the following clause:

"It is further understood and agreed that the Grantor has been compensated for the construction of a new fence and shall be responsible for constructing the necessary fencing within 30 Days from the date of closing. Grantor specifically understands and agrees that the fences are the property of the Grantor and they shall be liable and responsible for any reconstruction, maintenance, or adjustment with regard to such fencing."

DB Contractor shall make reasonable and good faith efforts to ensure that the property owners, who have been compensated for fencing of the remainder properties, erect the fence in accordance with the construction schedule.

If necessary to maintain the Project construction schedule and to control unauthorized access to the Project ROW by the public or livestock, DB Contractor shall be responsible for providing temporary fencing in cases where the property owner refuses to fence the property within the allotted timeframe.

After the property owner's retention period has expired and if any existing fencing remains, DB Contractor shall remove the existing fences from the newly acquired Project ROW and will be responsible for all costs associated therewith.

7.5 Early ROW Acquisition

TxDOT shall notify the DB Contractor if certain Project ROW parcels are scheduled to be acquired by Governmental Entities prior to issuance of the NTP. The DB Contractor will be updated regularly on the status of the acquisition process for each parcel.

After NTP, DB Contractor shall be responsible for coordinating the scheduling of any remaining early Project ROW acquisition by other Government entities with the Project Schedule. Based on the status of each parcel, TxDOT may require the DB Contractor to complete the acquisition of certain parcels.

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, so as to provide accurate information for the design of roadways, pavements, foundations, structures, and other facilities that result in a Project that is safe, and meets the DBA requirements.

8.2 Design Requirements

8.2.1 Subsurface Geotechnical Investigation by DB Contractor

DB Contractor shall determine the specific locations, frequency, and scope of all subsurface geotechnical investigations, testing, research, and analysis DB Contractor considers necessary to provide a safe and reliable roadway, pavement, foundation, structure, and other facilities for the Project.

DB Contractor shall prepare and amend, as needed, their Geotechnical Engineering Reports documenting the assumptions, conditions, and results of the geotechnical investigation and analysis, 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 and RQD for rock. If laboratory testing is required then the results 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, and short-term and long-term strength tests and properties

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, structures, slopes, and embankments

e) Slope stability analyses for embankment and excavation and retaining wall slopes including both short-term (undrained) and long-term (drained) conditions, and discussion of design measures undertaken to ensure stability and safety of all slopes. The design minimum factor of safety required for global stability of a slope 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) Plan view locations of field sampling, boring logs and other field data, laboratory test results, calculations, and analyses that support design decisions

The report shall:

a) Ensure that adequate investigation, testing, analysis, design, mitigative measures and construction planning are applied to assess and provide for the effects of swell pressures from expansive soil and rock materials on foundations and earth retaining structures. They shall address all design features and facility characteristics that could affect expansive soil behavior.

b) Provide design and construction parameters derived from geotechnical investigation.

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.

d) Layout of sample locations within Project limits.

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* shall be the basis for all pavement designs for the Project, and is supplemented with the requirements contained within this document as identified in the paragraphs in this section. Where there are conflicts between the requirements in these two documents, the requirements in this document shall take precedence.

The number of ESALs and/or the traffic volumes to be used in the pavement designs shall be those provided in Attachment 8-1, Traffic Data. Lane distribution factors for both flexible and rigid pavement designs shall be applied in accordance with the following criteria:

Table 1. Lane Distribution Factors

Total Number of Lanes in One Direction	Lane Distribution Factor
One or two lanes	1.0
Three lanes	0.7
Four or more lanes	0.6

DB Contractor should expect that subgrade materials will vary throughout the Project limits. DB Contractor shall verify that the materials encountered or imported meet the Effective Modulus of Subgrade Reaction, modulus, or other design subgrade support value as utilized for the structural section design. If the site subgrade materials have a differing 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) Frontage road pavements

c) Cross-road pavements

d) 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) Where applicable, life-cycle cost analysis, 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

h) Layout of sample locations

DB Contractor shall submit the following to TxDOT for review:

a) Pavement design reports including any later supplements or amendments

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

DB Contractor shall apply the pavement designs prepared for the various lane types described in this Section 8.2.2 above in the Base Scope to the equivalent lane types in the Option. If DB Contractor prepares multiple pavement designs for a particular lane type in the Base Scope, DB Contractor shall apply the most conservative pavement design for said lane type to the equivalent lane type in the Option.

8.2.2.1 Methodology Enhancements

Recognizing that the development of pavement design methods, products, and procedures are under continuous enhancement within the pavement community, the DB Contractor and TxDOT understand that new methods, procedures, and products may present opportunities for improved pavement design and management during the time frame of this DBA. Both parties mutually agree to consider the use of new design technologies provided that any such technologies and methods are agreed to by the DB Contractor and approved by TxDOT in writing prior to final implementation.

8.2.2.2 Related Pavement Materials Specifications

Unless otherwise specified herein, pavement material requirements are defined in the most current version of the TxDOT *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges* (hereafter referred to as the TxDOT *Standard Specifications*) and per special provisions as provided in these DBA Documents. Test procedures identified herein shall be the most current version identified in the Materials Test Procedures, AASHTO or ASTM standards or equivalent guidance as approved or provided by TxDOT.

8.2.2.3 Pavement Type Selection

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

Mainlane Pavement. In the case of rigid pavement selection, only Continuously Reinforced Concrete Pavement (CRCP) pavement is acceptable for the mainlane pavement.

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

Ramp Pavement. Ramp pavements shall be constructed with the same section (materials and depths) as the adjacent mainlane pavement.

8.2.2.3.1 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 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 Subase/Subgrade Reaction, psi/inch	300 psi/inch max.
Serviceability Indices ▪ Initial Serviceability Index ▪ Terminal Serviceability Index	 4.5 2.5
Load Transfer Coefficient	*
Drainage Coefficient	**
Overall Standard Deviation	0.39
Reliability %	95
Design Traffic, 18 Kip Equivalent Single Axle Load (ESAL)	Attachment 8-1***
* Table 8-1, *TxDOT Pavement Design Guide, Revised January 2011* ** Table 8-2, *TxDOT Pavement Design Guide, Revised January 2011* *** *2013 and 2043 ESAL data shall be utilized for rigid pavement design.*	

Effective Modulus of Subgrade Reaction. The Effective Modulus of Subgrade Reaction (k in psi/in) is to be used for design and the value to be achieved at all times during construction activities.

Potential Vertical Rise (PVR). DB Contractor shall design the overall subgrade and pavement structure to have a PVR no greater than 2.0 inch as calculated in accordance with TEX-124-E from soil tests in a soil column 15 feet deep as measured from the proposed finished pavement grade. Alternatively, DB Contractor shall provide materials that result in an Effective Plasticity Index (PI) of less than 25 when calculated to a depth of 8 feet from finished pavement surface for mainlane pavements, and to a depth of 7 feet from finished pavement surface for non-mainlane pavements. Calculation and sampling requirements for determination of Effective PI are stated in Section 8.3.1 (Pavement Material Requirements).

8.2.2.3.2 Flexible Pavement

Design Methodology. For flexible pavement design, the DB Contractor shall use the TxDOT online *Pavement Design Guide*. The pavement designs shall utilize either the TxDOT FPS 21 procedure or the 1993 *AASHTO Guide for the Design of Pavement Structures* and the latest version of the DARWin computer program, approved by AASHTO. All pavement thickness designs shall be checked using the Modified Texas Triaxial Class design method, and other analyses techniques necessary to prevent premature failure from rutting and fatigue.

Performance Life Requirements. The design life for the Project, excluding the pavement areas to be milled and overlaid described in Section 1.2.1, will be based on the following:

a) *Mainlane and Ramps.* A design life of 30 years shall be used with an initial performance period of at least 15 years.

b) *Frontage Road and Cross Roads.* A design life of 30 years shall be used with an initial performance period of 12 years when projected traffic loads are less than 1 million ESALs and 15 years for more than 1 million ESALs.

Potential Vertical Rise. DB Contractor shall design the overall subgrade and pavement structure to have a PVR no greater than 2.5 inch for mainlane and 2.5 inches for non-mainlane pavements as calculated in accordance with Tex-124-E from soil tests in a soil column 15 feet deep as measured from the proposed finished pavement. Alternatively, DB Contractor shall provide materials that result in an Effective Plasticity Index of less than 25 when calculated to a depth of 8 feet from finished pavement surface for mainlane and to a depth of 7 feet from finished pavement surface for non-mainlane pavements.

Calculation and sampling requirements for determination of Effective PI are stated in Section 8.3.1 *Pavement Material Requirements*.

Design Modulus. The DB Contractor shall establish the design modulus using laboratory resilient modulus tests conducted on representative samples of the soils supporting the pavement structures. This design modulus shall be used for 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, DB Contractor shall provide justification and documentation to TxDOT which demonstrates that an equivalent pavement structure will be provided.

(a) Effective Resilient Modulus, (MR). Effective Resilient Modulus testing is only applicable to subgrade materials; that is, natural subgrade or materials imported as embankment and are not stabilized. Determine the MR using the AASHTO laboratory test method T307 for subgrade soil samples over the Project, or segments of the Project, with an adjustment of test results for seasonal variations, per AASHTO *Guide for the Design of Pavement Structures, 1993*. Only load sequence number 7 of 15 (4 psi confining pressure, 4 psi maximum axial stress for Type 2 materials; 10 psi confining pressure, 10 psi maximum axial stress for Type 1 materials) will be used to determine the test result.

Where multiple layers of material are present, MR shall be determined for the predominant soil within three feet in depth from the finished pavement subgrade elevation. Where rock is the predominant subgrade and MR determination is not practical, a maximum MR of 25,000 psi may be assumed.

Run tests on samples at optimum moisture content (OMC), 2% dry of OMC, and 2% wet of OMC. Optimum moisture content shall be determined by the appropriate TxDOT compaction procedure; molding shall be governed by the appropriate method for the material tested as identified in AASHTO T307.

Distribute MR values as shown in Table 3 for the region in which the DB Contractor will be constructing the project. Determine which distribution to apply by selecting the rainfall range appropriate for the project location from Figure 1.

Table 3. Regional distribution of months used to determine Effective Resilient Modulus.

Region	Annual Rainfall Range	Moisture Content Weighting in Months		
		- 2% OMC	@ OMC	+ 2% OMC
1	0 – 12	6	4	2
2	12 – 24	4	4	4
3	24 – 36	2	5	5
4	36 – 48	2	4	6
5	48 – 56	0	3	9

(b) Unbound Base and Subbase. Only material meeting the definition of Unbound Base in Section 8.3.1 will be considered; all other unbound materials used as a pavement layer that do not meet this definition shall be considered subgrade/embankment. For materials meeting the requirements of Item 247, TxDOT *Standard Specifications*, the design modulus shall not exceed three times the Effective Resilient Modulus for the layer immediately below the unbound base or subbase layer, and shall not exceed 75,000 psi.

(c) Stabilized Base. Stabilized base materials shall meet the requirements of Stabilized Base in Section 8.3.1, or shall be considered a subgrade or subbase material that may require stabilization. The design moduli of stabilized base materials shall be established by the greater of: (a.) the ratio of stress to strain in a near-linear portion of the loading curve during UCS testing, or (b.) ten times the Effective Resilient Modulus for subgrade, whichever is greater. Refer to Table 3 for asphalt stabilized base moduli.

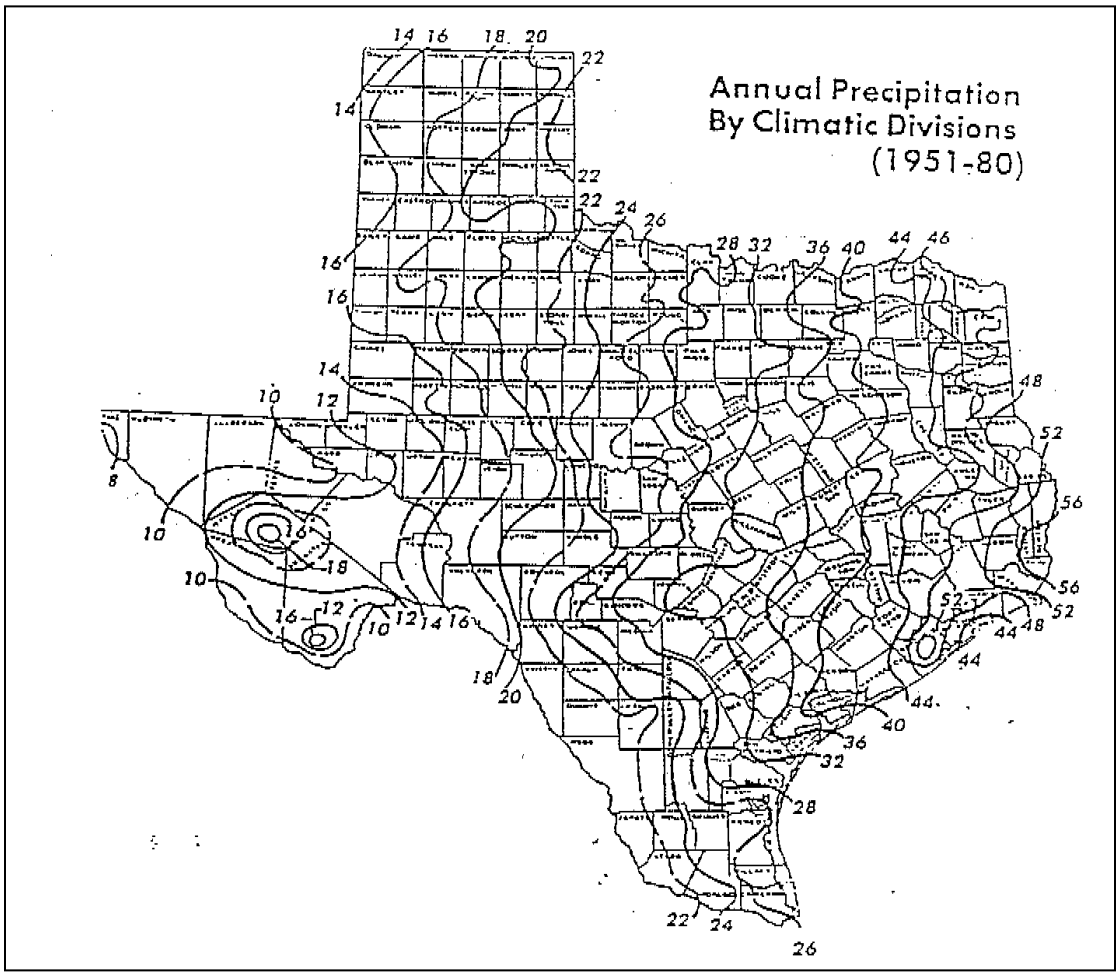

Figure 1. Rainfall graph for determining regional soil testing requirements

(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. Use Table 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 4. Design Structural Values

Material Type	2004 Specification	Maximum Modulus for FPS 21	AASHTO layer coefficient (max.)
Dense-Graded Hot Mix Asphalt	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 RBL: 350ksi	 0.45 0.46 0.47 RBL: 0.40
Stone-Matrix Asphalt	Item 346	Same as Item 344	Same as Item 344
Unbound Base	Item 247, Grade 1	*75ksi	0.14
Stabilized Base ▪ Cement ▪ Asphalt	 Items 275 and 276 Item 292	 *200ksi 350 ksi	 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. 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*. 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 8-1.

Initial ADT and 20yr projected ADT. The Initial ADT is the projected ADT when the Project is opened for public access as provided in Attachment 8-1. The ADT projected to occur 20 years after the Project is opened to public access is provided in Attachment 8-1.

Initial Serviceability Index. The initial serviceability index for mainlane pavements on this Project shall be 4.5. Frontage road pavements shall use an initial serviceability index of 4.2.

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 3.0 (mainlane and frontage roads).

Serviceability Index After a Structural Overlay (FPS design only). Where no level up course of hot mix asphalt (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% for mainlane, ramps, frontage roads and cross roads.

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

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

Mill and Overlay Areas. DB Contractor shall not be required to submit pavement design for the mill and overlay areas described in Sections 1.2.1 and 1.3.1. The areas of full-depth pavement repair shall meet the requirements described in Section 11.2.3.

8.3 Construction Requirements

8.3.1 Pavement Materials Requirements

The DB Contractor shall incorporate the following requirements into the preparation of the initial pavement designs for the Proposal and the subsequent final pavement designs, plans, quality control and quality assurance programs, and the field construction procedures. Subject to approval by the 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. The 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. Use the TxDOT *Guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures* to assist with testing and detection and construction practices. No soil shall have additives introduced to such material that would cause a detrimental reaction to the pavement structure or its ride quality as measured by the International Roughness Index (IRI).

Effective Plasticity Index (PI). The same method of determining Effective PI shall be used for both design and verification of design. DB Contractor shall determine the Effective PI for unstabilized subgrade to the depth specified below finished pavement surface. The Effective PI shall be determined, using Tex-106-E, via a process that proportionately accounts for the plasticity contribution of the soil binder (material passing the #40 sieve) for each individual one foot layer, or portion thereof, to the depth specified. The Effective PI is ultimately a weighted average of the Plasticity Indices of the material in the soil column analyzed. For example, the sum of all PI measurements representative of each one foot deep sample tested divided by the total depth designated by the pavement type. Use soil to the depth of 8 feet for mainlane pavements and 7 feet for non-mainlane pavements for calculation of Effective PI. Concrete, hot mix asphaltic concrete, stabilized base courses, granular base, and stabilized subgrade/embankment are considered to be non-swelling with no PI. Stabilized materials shall meet material requirements stated herein.

Unbound Base. Provide the appropriate unbound base as recommended in the TxDOT *Pavement Design Guide*. A minimum placement thickness of 6 inches is required.

Stabilized Base. Stabilized base may either be modified with chemical additives or asphaltic binders. Materials to be stabilized shall meet the requirements of either Grade 1, Grade 2, or Grade 5 base as defined by Item 247 of the TxDOT *Standard Specifications* or appropriate special provisions, and shall have a minimum thickness of 6 inches. Asphalt stabilized base material will meet the requirements of Item 292 of the TxDOT *Standard Specifications*. When chemical additives are used to stabilize base, Table 5 will be used to determine the stabilizer content. Stabilized base will be designed to achieve the unconfined compressive strength shown in Table 5 immediately following a 10-day capillary moisture conditioning. Moisture conditioning will be conducted in a similar method as that used in TEX-121-E.

Table 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

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, Grade 1 or 2 may replace these materials without restriction.

(b) Stabilized Subbase. Materials not included in Granular Materials above, do not meet the requirements of Item 247, TxDOT Standard Specifications, or materials that have a Plasticity Index (PI) value less than 25, 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 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 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 any untreated or 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. Where flexible pavement structures are selected, the final surface mix for mainlane lanes and ramps shall be Stone-Matrix Asphalt (SMA) meeting the requirements of Item 346 of the TxDOT Standard Specifications. The final surface mix for frontage roads and cross roads shall be a regular

dense-graded mix Type D meeting the requirements of Item 341 of the TxDOT Standard Specifications when the combined HMA thickness is greater than 6.0 inches, or SMA meeting the requirements of Item 346 of the TxDOT Standard Specifications when the combined HMA thickness used is less than 6.0 inches.

8.3.2 Construction Verification

General. The independent Construction Quality Acceptance Firm (CQAF) shall perform the DB Contractor's quality acceptance. The construction verification tasks described below are part of the CQAF quality acceptance efforts.

Effective Modulus of Subgrade Reaction. The 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 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). The 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 the TxDOT.

Effective Plasticity Index (PI). The DB Contractor shall demonstrate to TxDOT that the specified design requirements are met by randomly selecting at least one location per 2,500 linear feet of roadbed and shall sample the subgrade materials to a depth below finished pavement surface as designated by the pavement design. Mainlane roadbeds, ramps, and frontage roadbeds are considered independently. Sampling shall also take place when a recognizable change in the subgrade material is encountered during grading operations as determined by a change in Unified Soil Classification System classification.

The DB Contractor shall provide for the testing of these materials in accordance with Tex-106-E to determine the Effective PI. The results shall be compared to design requirements to confirm that the strata meet the design criteria. If the materials fail to meet the criteria, DB Contractor shall be responsible to take corrective action that is acceptable to TxDOT.

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

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

TxDOT will evaluate profiles based on the 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.

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 *General Rules of Procedures and Practices* of the Texas Board of Professional Land Surveying. DB Contractor shall ensure that any person in charge of a survey field party is proficient in the technical aspects of surveying.

9.2.2 Right-of-Entry

DB Contractor shall secure written permission prior to entering any private property outside the ROW. It shall be DB Contractors' sole responsibility to negotiate this permission and DB Contractor shall be responsible for any and all damages and claims resulting from that ingress. Proper documentation of right-of-entry shall be maintained at all times by DB Contractor.

9.2.3 Survey by TxDOT

In performing surveys for other adjoining projects, TxDOT may need to verify and check DB Contractor's survey work. DB Contractor shall coordinate with the DB Contractor of the adjoining project regarding planned construction activities. DB Contractor shall notify TxDOT within 2 Business Days if TxDOT stakes and marks are altered or disturbed.

9.3 Design Requirements

9.3.1 Units

All survey Work shall be performed in the U.S customary units system of measurement. Work shall conform to state plane coordinates. The surface adjustment factor for the Project is 1.00017 (Plane Coordinates x 1.00017 = Surface 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 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 to be provided by TxDOT.

All survey control points shall be set and/or verified by a Registered Professional Land Surveyor licensed in the State of Texas.

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

Monuments shall be TxDOT bronze survey markers installed in concrete and marked as directed by the most current edition of 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.

9.3.3.1 Horizontal Accuracy Requirements for Conventional Surveys

Horizontal control is to be established (at a minimum) on the Texas State Plane Coordinate System NAD 83.

	Level 3	Level 4	Remarks and Formulae
Error of Closure	1: 50,000	1:20,000	Loop or between monuments
Allowable Angular Closure	± 3" $\sqrt{N}$	± 8" $\sqrt{N}$	N= number of angles in traverse
Accuracy of Bearing in Relation to Course *	± 04”	± 10”	Maximum for any course
Linear Distance Accuracy (Minimum Length of Line)	1: 50,000 (2,500 feet)	1: 20,000 (1,000 feet)	
Positional Tolerance of Any Monument	*AC*/50,000	*AC*/20,000	*AC* = length of any course in traverse
Adjusted Mathematical Closure of Survey (No Less Than)	1:200,000	1:200,000	

* TxDOT policy requires all bearings or angles 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).

	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 should be identically matched
Principal Uses	Broad area control, subsidence or motion studies jig & tool settings	Broad area control, engineering projects basis for subsequent level work	Small area control, drainage studies, some construction and engineering	

9.3.4 Right of Way Surveys

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

9.3.4.1 Accuracy Standard

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.

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 Final 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 Surveyor, or the Surveyor's 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 ½-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 current 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 ½-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.

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.

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.

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 be submitted to TxDOT for approval no later than 60 days prior to the scheduled date for NTP2 for the Base Scope and NTP4 for the Option, if the Option is exercised by TxDOT.

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 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.

DB Contractor shall salvage approximately 8,000 cy of recycled asphalt pavement (RAP) from within the limits of the Project. DB Contractor shall deliver RAP to an area along Loop 1604 between Wiseman Boulevard and Military Drive. DB Contractor shall stockpile the RAP within the TxDOT ROW in a stable condition a minimum of 30’ from any edge of pavement and no higher than 10’ above the elevation of the adjacent edge of pavement. The approximate dimensions of the stockpile location shall be 15’ wide by 1,440’ wide. The stockpile shall not affect existing drainage patterns or driveway access.

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.

The series of landscaped areas within the ROW at the intersection of Loop 1604 and SH 16 shall not be impacted by the Work, unless approved by TxDOT.

The relatively large live oak tree (approximately 60 inches dbh) located on the western side of the ROW between the southbound mainlanes and southbound frontage road just south of SH 16 shall not be impacted by the DB Contractor. Safety concerns around this oak tree shall be mitigated by the DB Contractor. The heritage oak tree located just north of Culebra Road between the southbound mainlanes and southbound frontage road shall not be impacted by the DB Contractor.

All trees not affected by construction within the limits of the Project shall be protected utilizing approved TxDOT San Antonio District methods and techniques.

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 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 areas 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.

Where the Work requires topsoil as a surface and where topsoil was supporting vegetation in the existing condition, the DB Contractor shall use compost manufactured topsoil – blended in place (4"). In the existing condition, where topsoil was lacking or was not supporting vegetation due to poor quality, the DB Contractor shall use compost manufactured topsoil – pre-blended (4") or blended on site (4").

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 roadway improvements to help attain the Project objectives.

DB Contractor shall coordinate roadway design, construction, and maintenance with other Elements of the Project to achieve the objectives of the Project.

Where changes to the roadway geometrics result in revisions to the Project ROW, DB Contractor is responsible for demonstrating the proposed change is an equally safe alternative as well as the initiation and progression of all environmental and public involvement processes in coordination with TxDOT. DB Contractor shall perform all ROW services that are necessitated by proposed changes in accordance with the DBA Documents.

11.2 Design Requirements

DB Contractor shall coordinate its roadway design with the design of all other components of the Project, including aesthetics. The Project roadways shall be designed to integrate with streets and roadways that are adjacent or connecting to the Project. All design transitions to existing facilities shall be in accordance with the TxDOT *Roadway Design Manual*.

DB Contractor shall design all Elements in accordance with the applicable design criteria and Good Industry Practice based on the Design Speeds for various Elements.

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 deleted in the Schematic Design, DB Contractor shall maintain all existing property accesses, including those not shown on the schematic, 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.

DB Contractor shall coordinate, design and construct the improvements on crossing streets in accordance with the Governmental Entity having jurisdiction of said roadway.

Table 11-1: Roadway Design Criteria

Design Elements	Loop 1604 Mainlanes	SH 151 Mainlanes	Frontage Roads	Ramps/Direct Connectors	Cross Streets
Functional classification	Urban freeway	Urban freeway/ Major Arterial	Urban collector	N/A	Shaenfield Road, New Guilbeau Road & Braun Road[1]
Design speed	60 mph	55 mph	40 mph	40 mph	45 mph
Min. horiz. curvature	1340’	1065’	675’	510’	940’
Max. super-elevation rate	6%	6%	N/A	6%	N/A
Lane widths	12’	12’	12’	14’	12’
Curb Offset	N/A	N/A	1’	N/A	1’
Shared lane widths	N/A	N/A	14’	N/A	14’
Bicycle lane widths	N/A	N/A	5’	N/A	5’[4]
K value – sag	136	115[2]	64[5]	64	79
K value – crest	151	114[2]	44[5]	44	61
Maximum grade	4%	4%[3]	8%	8% (ramps); 6% (direct connectors)	5%
Minimum grade	0.5%	0.35% (curbed); 0.5% (uncurbed)	0.35% (curbed); 0.5% (uncurbed)	0.35% (curbed); 0.5% (uncurbed)	0.35% (curbed); 0.5% (uncurbed)
Vertical clearance	16.5’	16.5’	16.5’	16.5’	16.5’
Design vehicle	N/A	WB-62	WB-62	N/A	WB-62
Outside shoulder	10’	10’	N/A	8’	N/A
Inside shoulder	4’	4’	4’ (uncurbed)	2’ on roadway, 4’ on structure	N/A

Notes:

1. Intersecting streets other than Shaenfield Road, New Guilbeau Road and Braun Road that intersect or tie into a roadway which the DB Contractor is constructing must improve or retain the existing geometry of the intersecting street, or meet the design criteria for the roadway classification of the intersecting street.

2. For the SH 151 mainlanes west of STA 548+00, the K-Values shall meet a minimum design speed of 45 mph.

3. For the eastbound SH 151 mainlanes west of STA 548+00, the maximum grade shall be 4.5%. For the westbound SH 151 mainlanes west of STA 548+00, the maximum grade shall be 6.5%.

4. A bicycle lane is not required along Braun Road within the Project limits.

5. Westbound and eastbound Alamo Ranch Parkway Re-alignments shall meet K-values for a 40 mph design speed. The westbound Alamo Ranch Parkway Re-alignment shall have a maximum vertical grade of 4% and the eastbound Alamo Ranch Parkway Re-alignment shall have a maximum vertical grade of 5%.

11.2.2.1 Superelevation

Existing superelevation in areas where ramps are to connect to existing pavement may be retained at existing superelevations, if it meets the criteria in Table 2-6 of the TxDOT Roadway Design Manual. Pavement widening may be constructed by extending the existing pavement cross slope, if it meets the criteria in Table 2-6 of the TxDOT Roadway Design Manual. Superelevation transitions shall be designed and constructed such that zero percent cross-slopes will not occur on bridges or 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, pavement widening adjacent to existing pavement shall be constructed 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.

Cross slopes in the milled and overlaid pavement areas described in Section 1.2.1 shall be equal to or better than the existing condition.

11.2.2.2 Roadway Design Deviations

The DB Contractor shall design and construct the following elements to meet the specific criteria below:

a) In the Base Scope, the border width along the northbound frontage road from STA 230+79 to STA 233+71 shall be a minimum of 8 feet.

b) In the Base Scope, the border width along the southbound frontage road from STA 170+28 to STA 173+41 shall be a minimum of 9 feet.

c) In the Base Scope, the control of access along the Loop 1604 southbound frontage road shall exist approximately from mainlane STA 852+50 to STA 857+50.

d) In the Option, to mitigate restrictions on the design imposed by sight distance, the southbound Loop 1604 to eastbound SH 151 direct connector may have a 10’ inside shoulder and 2’ outside shoulder.

The design criteria described in other sections of the Technical Provisions other than the specific criteria listed above shall be followed.

11.2.3 Miscellaneous Roadway Design Requirements

All roadside safety devices used on the Project shall meet current crash test and other safety requirements in accordance with TxDOT standards.

Driveways shall be designed in accordance with the guidelines, which will be considered requirements, specified in TxDOT’s *Roadway Design Manual* – Appendix C, “Driveways Design Guidelines” to be functionally adequate for land use of adjoining property.

The border width, measured from back of curb, along frontage roads and crossing streets shall be 15 feet minimum unless specified otherwise in these Technical Provisions.

Pavement areas described in Sections 1.2.1 and 1.3.1 shall be milled and overlaid with the same surface material and thickness used on the adjacent reconstructed pavement. The thickness of the milling and overlay, however, shall be a minimum of two inches. In the milled and overlay sections, the DB Contractor shall construct 12,500 square yards of full-depth pavement repair for the Base Scope and 10,000 square yards of full-depth pavement repair for the Option. Approximate locations of full-depth pavement repair shall be submitted to and approved by TxDOT prior to initiation of this work. The areas of full-depth pavement repair shall be replaced with the same materials and thicknesses as the same pavement section as existing.

Raised concrete islands shall be utilized at frontage road/cross street intersections.

The DB Contractor shall use either permanent concrete traffic barrier or cable barrier between the northbound and southbound mainlanes. In addition to the criteria in Table 11-1, DB Contractor shall design and construct Shaenfield Road, New Guilbeau Road and Braun Road in accordance with Table 11-2. DB Contractor shall not design and construct bridge bents in the center median of the intersecting streets.

Table 11-2: Intersecting Street Cross Sections

	Westbound (ft)								Eastbound (ft)						
Intersecting Street Cross Section	**Curb**	**Turn Around**	**Curb**	**Turnaround Raised Median**	**Curb**	**Pavement**	**Curb**	**Center Raised Median**	**Curb**	**Pavement**	**Curb**	**Turn Around Raised Median**	**Curb**	**Turn Around**	**Curb**
Braun Road*	**1**	**25**	**1**	**23**	**1**	**38**	**1**	**5**	**1**	**38**	**1**	**23**	**1**	**25**	**1**
New Guilbeau Road	**1**	**24**	**1**	**49**	**1**	**26**	**1**	**12**	**1**	**26**	**1**	**49**	**1**	**24**	**1**
Shaenfield Road	**1**	**24**	**1**	**38**	**1**	**28**	**1**	**2**	**1**	**28**	**1**	**38**	**1**	**24**	**1**

*Existing facility.

For the Option, if exercised by TxDOT, DB Contractor shall ensure that any edge of pavement or structure is clear of the box comprised of the following four coordinates:

- Northing: 13,724,606.28, Easting: 2,062,924.57
- Northing: 13,724,598.63, Easting: 2,062,874.23
- Northing: 13,724,613.92, Easting: 2,062,974.90
- Northing: 13,724,555.94, Easting: 2,062,932.21

This box includes the known karst feature labeled as “Feature 19” in the “1p_option-1604-151interchange.pdf” file available in the RID and also labeled as “Feature 151-019” in the electrical resistivity survey available in the RID.

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 the DB Contractor shall design and construct a solution that does not adversely impact property owners outside the ROW.

In areas outside the Project ROW or areas within the Project ROW but not affected by the Work, DB Contractor is not responsible for upgrading the existing drainage system whether or not it is determined to meet the criteria in the current TxDOT Hydraulic Design Manual in the existing condition. However, the Work shall not cause any existing drainage system condition to become substandard nor shall it make worse any drainage condition.

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; and official documents concerning the Project, such as 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 geographic information system (GIS) data for the Project limits that depicts the Outstanding National Resource Waters and/or impaired waters as listed by the TCEQ. DB Contractor shall conduct surveys for information not available from other sources.

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 in accordance with the *TxDOT Hydraulic Design Manual*, Chapter 3, Section 4.

The data collected shall be taken into account in the Final Design of the drainage facilities.

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

a) Record set of all drainage computations, both hydrologic and hydraulic, and all support data.

b) Hydraulic notes, models, and tabulations

c) Storm sewer drainage report

d) Bridge and culvert designs and reports for major stream crossings

e) Pond designs, including graphic display of treatment areas and maintenance guidelines for operation

f) Correspondence file

g) Drainage system data (location, type, material, size, and other pertinent information) in a suitable electronic format

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.

12.3 Design Requirements

DB Contractor shall design all Elements of the drainage facilities in accordance with the applicable design criteria and Good Industry Practice.

The design of drainage systems shall include reconfiguration of the existing drainage systems within the Project limits, and design of new and reconfigured storm drainage systems as required to meet the performance requirements as defined in this Section 12.

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

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

DB Contractor shall design roadside open channels such that the profiles have adequate grade to minimize sedimentation.

The DB Contractor shall provide a drainage system that maintains or improves the existing drainage.

The DB Contractor shall comply with *Detention Best Management Practices Guidelines for TxDOT Projects Memorandum* dated June 1, 2012, which shall be considered requirements.

12.4 Surface Hydrology

12.4.1 Design Frequencies

DB Contractor shall use the design frequencies listed in Table 12-1 below.

Table 12-1: Drainage Design Frequencies

Functional classification and structure type	Design Annual Exceedance Probability (AEP)				
	50% (2-yr)	20% (5-yr)	10% (10-yr)	4% (25-yr)	2% (50-yr)
Freeways (mainlanes):					
Culverts					X
Bridges					X
Principal arterials:					
Culverts			X		
Small bridges			X		
Major river crossings					X
Minor arterials and collectors (including frontage roads):					
Culverts			X		
Small bridges				X	
Major river crossings					X
Local roads and streets *:					
Culverts		X			
Small bridges			X		
Off system projects					
Culverts	Hydraulically same or slightly better than existing				
Bridges					
Storm drain systems on interstates and controlled access highways (mainlanes and ramps):					
Inlets			X		
Storm drain pipes			X		
Inlets for depressed roadways*					X
Storm drain systems on other highways and frontage roads:					
Inlets and drain pipe			X		
Inlets for depressed roadways*					X

Notes.

* A depressed roadway provides nowhere for water to drain even when the curb height is exceeded.

Storm drains on facilities such as underpasses, depressed roadways, etc., where no overflow relief is available should be designed for the 2% AEP event.

All facilities must to be evaluated to the 1% AEP event.

Drainage design for existing local roads and cross streets shall meet existing or better, however 5-yr minimum.

12.4.1.1 Hydrologic Analysis

DB Contractor shall design for the future changes in land use that may affect the magnitude of runoff and therefore the design capacity of drainage structures. DB Contractor shall incorporate anticipated changes in the basin land use, characteristics, or water operations into the hydrologic parameters. DB Contractor shall design all drainage facilities to accommodate the City of San Antonio land use map.

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

The DB Contractor shall provide detention for runoff at Helotes Creek and Culebra Creek, both which are located in City of San Antonio Mandatory Detention Zones.

12.4.2 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 including top of manhole 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 1 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 USACE shall be conveyed in accordance with applicable laws and permits.

“T” connections and “Y” connections in storm sewer systems are not allowed.

Refer to Section 13.2.6 for requirements for storm sewer systems adjacent to MSE retaining walls.

12.4.2.1 Pipes

Storm sewer pipes with design flow velocities less than 3 feet per second shall be designed for full flow at 80% of the internal diameter to account for sedimentation in the pipe. Other storm sewer pipes shall be designed using the full internal diameter. Storm sewers shall be designed to prevent surcharging of the system at the flow rate for the design year event. All storm sewers shall be designed and constructed to sustain all loads with zero deflection and shall have positive seals at the pipe joints.

Design flow velocities in storm sewer pipes shall not exceed 12 feet per second.

All pipes shall be reinforced concrete pipe, with the exception of pipes behind MSE walls.

The minimum pipe size inside diameter shall be 24" for laterals, 24" for laterals placed under pavement, and 24" for trunk lines. The minimum box culvert height, inside dimension, shall be 3 feet.

Existing corrugated metal pipe can be utilized only if it is less than 50 years old and is in adequate condition. When extending corrugated metal pipe, DB Contractor shall construct concrete junction boxes at the connection between the existing pipe and new pipe.

The DB Contractor shall meet the requirements of Chapter 10, Section 6 of the TxDOT *Hydraulic Design Manual* for manhole spacing.

12.4.2.2 Ponding

DB Contractor shall design drainage systems to limit ponding to the widths described in Chapter 10, Section 2 of TxDOT's *Hydraulic Design Manual*.

12.4.3 Miscellaneous Drainage Design Requirements

DB Contractor shall use TxDOT-San Antonio District Standards for the design of curb inlets and drop inlets.

Curb extensions are limited to one 10' maximum curb extension.

Grate inlets within a roadway or driveway are not allowed.

12.4.4 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 NPDES regulations. Local requirements, if more stringent, shall be handled by DB Contractor with a third party agreement.

DB Contractor shall ensure that stormwater storage facilities meet the requirements listed above by performing all required analyses. Such analyses shall include flood routing analysis, which includes a detailed routing analysis for ponds affected by significant environmental issues such as hazardous waste or groundwater concerns.

12.4.5 Hydraulic Structures

12.4.5.1 Culverts

DB Contractor shall analyze existing and proposed culverts and drainage-ways impacted, replaced, or created by the Project design, for any localized flooding problems.

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.

Culverts are classified as major or minor, as follows:

- Major Culvert: A culvert that provides an opening of more than 35 square feet in a single or multiple installations. A major culvert may consist of a single round pipe, pipe arch, open or closed-bottom box, bottomless arch, or multiple installations of these structures placed adjacent or contiguous as a unit. Certain major culverts are classified as bridges when they provide an opening of more than 20 feet, measured parallel to the roadway; such culverts may be included in the bridge inventory. Bridge class culverts shall have a minimum rise of 4'.

- Minor Culvert: Any culvert not classified as a major culvert.

Existing bridge class culverts with a sufficiency rating of less than 50 shall be classified as deficient.

Bridge class culverts shall be analyzed and designed using HEC-RAS. Minor culverts shall be analyzed and designed using HY8.

12.4.5.2 Bridges

All bridge hydraulic computations, designs, and recommendations shall be consistent with past studies and projects in the area by the USACE and other State or federal agency studies and projects.

Where bridge design is influenced by upstream storage, the analysis of the storage shall be considered in the design of the bridge.

12.4.5.3 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 studied floodplain (Zone AE) with peak flow information, DB Contractor shall gather and utilize, as appropriate, the current effective model. For a crossing not located within a FEMA Zone AE but on the same waterway as a stream gauging station with a length of record of at least 25 years, DB Contractor shall collect and use the flow data available from the station, as appropriate, to determine design flows within the following limitations, provided there is no major control structure (e.g., a reservoir) between the gauge and the Project:

a) For crossings near the gauging station on the same stream and watershed, use the discharge directly for a specific frequency from the peak stream flow frequency relationship.

b) For crossings within the same basin but not proximate to the gauging station, transposition of gauge analysis results is allowable.

c) For crossings not within a gauged basin, the peak-flow flood frequency shall be developed using data from a group of several gauging stations based on either a hydrologic region (e.g., regional regression equations), or similar hydrologic characteristics.

d) If no significant changes in the channel or basin have taken place during the period of record, the stream gauging data may be used. The urbanization character of the watershed must not be likely to change enough to affect significantly the characteristics of peak flows within the total time of observed annual peaks and anticipated service life of the highway drainage facility.

For crossings not located within a FEMA Zone AE or on a gauged waterway, DB Contractor shall select the appropriate method for calculating the design flows based on site conditions, and Good Industry Practice.

12.4.5.3.1 Design Frequency

Major river crossings, bridges, culverts and storm drain systems shall be designed for the frequency corresponding to the functional classification of the associated roadway. The functional classification for each roadway is shown in Section 11. There are no major river crossings on this Project.

DB Contractor shall evaluate bridges for contraction scour and pier scour concerns in accordance with FHWA Hydraulic Engineering Circular No. 18 (HEC-18) – Evaluating Scour at Bridges and incorporate protection in accordance with Good Industry Practice. DB Contractor shall provide a scour analysis in accordance with TxDOT's Geotechnical Manual (Chapter 5-Section 5, Scour) for all new bridges. If necessary, the DB Contractor shall provide countermeasures for any instability and scour problems in accordance with FHWA Hydraulic Engineering Circular No. 23 - *Bridge and Scour and Stream Instability Countermeasures Experience Selection and Design Guidance*.

For interstate highways, the design flood to be used in the detailed design shall be the 50 year frequency and the 100-year frequency shall be checked for no rise in water surface elevation.

12.4.5.3.2 Hydraulic Analysis

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.

12.4.5.3.3 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 for any frequency event 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.

12.4.5.3.4 Bridge Deck Drainage

Stormwater flowing toward the bridge shall be intercepted upstream from the approach slab. Runoff from bridge deck drainage shall be treated as required by TCEQ or other applicable regulation prior to discharge to the natural waters of the State.

Open deck drains are not permissible for bridges passing over waterways or other roadways. If ponding width limits require, runoff shall be conveyed in a closed system through the bridge columns to the roadway drainage system below. The bridge deck drainage system shall outlet at the bottom of the substructure either into a storm sewer system or into an open channel and in no case shall be allowed to discharge against any part of the structure.

12.4.5.3.5 Drainage Report for Major Stream Crossings

DB Contractor shall prepare a report for each major stream crossing. Major stream crossings are defined as waterways listed as a FEMA studied floodplain (Zone AE) or requiring a bridge class structure, which is defined as any bridge or a culvert with a total opening width greater than or equal to twenty feet. Any other waterway will be by default a minor stream crossing.

The report shall include the detailed calculations and electronic and printed copies of the computer software input and output files, as well as a discussion about hydrologic and hydraulic analysis and reasons for the design recommendations and shall be a component of the Drainage Design Report. At a minimum, for each crossing the report 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

The scour analysis shall be signed and sealed by a Texas Registered (or Licensed) Professional Engineer. In addition to being a component of the Drainage Design Report, the scour analysis shall also be provided as a separate document from the Drainage Design Report.

12.5 Drainage Design Report

A preliminary Drainage Design Report shall be submitted to TxDOT as part of the Preliminary Design Submittal. The preliminary Drainage Design Report shall adress all items to be included in the Final Drainage Design Report listed below. 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) Hydraulic notes, models, and tabulations

c) Bridge and culvert designs and reports for major stream crossings including all items listed in Section 12.3.4.1.6

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 reports (if applicable)

12.6 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 DBA Documents, the current AASHTO *LRFD Bridge Design Specifications* except where directed otherwise by the TxDOT *Bridge Design Manual – LRFD*, the TxDOT *Geotechnical Manual*, and the TxDOT *Bridge Detailing 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 design life specified in the applicable requirements for Project bridges, walls, culverts and miscellaneous structures.

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.

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*.

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

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

Bridges crossing over the Project shall, at a minimum, be designed to accommodate the Project and all planned expansions or updates of each facility by its respective owner as designated in the owner's current transportation master plan. Alignments shall meet the requirements indicated in Section 11 for the functional classification of each roadway.

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 roadway bridges and 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*, 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.

Total unit length shall be limited to avoid the use of modular joints. Sealed expansion joints may be used when anticipated movement is less than or equal to up to 5 inches.

DB Contractor shall minimize the number of deck joints wherever possible. DB Contractor shall locate joints to provide for maintenance accessibility and future replacement. All bridge joints 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.

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, the 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 shall design and construct bridge foundations in compliance with the TxDOT *Geotechnical Manual*.

Spread footing foundations are not allowed in the Base Scope. Spread footings are allowed in the Option.

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 TxDOT *Bridge RailingManual*. DB Contractor shall protect sidewalks from vehicular impact by using TxDOT-approved bridge railings.

DB Contractor shall use single slope traffic rail.

13.2.6 Retaining Walls

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.

c) DB Contractor designs and constructs walls according to TxDOT standards and complies with the TxDOT *Geotechnical Manual*.

d) Global stability calculations for retaining walls shall be signed and sealed by a Texas Registered (or Licensed) Professional Engineer who is the engineer of record for the retaining wall design. Global stability calculations shall be submitted to TxDOT in compliance with Section 2.2.7.5.

Modular walls employing interlocking blocks shall not be used where surcharge loads from vehicular traffic are present or where the retaining wall is expected to be inundated by flood water.

The design of wall structures shall take into account live load surcharges. The 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 Maintenance Management Plan and Good Industry Practice.

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

To the extent possible, DB Contractor shall design and construct components of the Project to provide embankments without the use of retaining walls. Where earthen embankments are not feasible, DB Contractor may use retaining walls.

Metal walls, including bin walls and sheet pile walls, recycled material walls and timber walls are not allowed.

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.

DB Contractor shall consider the construction and placement of reinforcing strips and wall panels when storm sewers, inlets and other obstructions are located within the reinforced mass of an MSE retaining wall. Inlet length shall be limited to five feet when placed at the top of the MSE wall. Storm sewer lines shall not be placed parallel to the MSE wall immediately behind the MSE wall panels. The DB Contractor shall provide reinforcement guidance to the fabricator for any obstructions longer than five feet behind an MSE wall.

13.2.7 Noise/Sound Walls

DB Contractor shall design and construct the noise/sound walls to achieve the decibel reduction requirement in the Environmental Approval(s).

Panel design and construction shall limit the risk of falling debris resulting from traffic impacting the sound wall.

Timber sound walls are not allowed.

DB Contractor shall design and construct noise/sound barriers in compliance with the AASHTO *LRFD Bridge Design Specifications* and the AASHTO *Guide Specification for Structural Design of Sound Barriers*.

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, sign supports shall be provided at 500-foot intervals. The sign supports shall accommodate sign areas up to and including 16 square feet. Cantilever and sign bridge supports shall be placed outside the clear zone or shall be otherwise protected by appropriate safety measures.

DB Contractor shall design and construct sign, illumination and traffic signal supports in compliance with the AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires and Signals.

13.2.10 Widenings

DB Contractor shall complete load ratings of existing structures to be widened. Load ratings shall be based on the AASHTO HS ratings system. However, design shall be based on HL 93 loading.

13.2.11 Structures to be Used in Place or Rehabilitated

Not used.

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 for Construction and Maintenance of Highways, Streets, and Bridges*, latest version, shall be applied to the following as a minimum:

a) Inside and top of inlets
b) Inside and top of manholes
c) Inside of sewer appurtenances
d) Inside of culvert barrels
e) Bottom of bridge slabs between girders or beams
f) Vertical and bottom of surfaces of interior concrete beams or girders.

13.3.2 Structure Metals

Welding shall be in accordance with the requirements of the AASHTO/AWS DI.5 2010 Bridge Welding Code. The DB Contractor shall follow preferred practices for Steel Bridge Design Fabrication and Erection (by the Steel Quality Council).

13.3.3 Steel finishes

Except for weathering steel, all structural steel shall be protected. The color for structural steel paint shall conform to the aesthetic scheme of the Project.

If weathering steel is used, the DB Contractor shall protect all components of the structure (superstructure and substructure) that are susceptible to corrosion and/or staining from weathering steel run-off.

13.3.4 Construction Methods

Concrete surface treatment is not required on the riding surface reinforced concrete slabs.

The DB Contractor is not required to use entrained air in its structural concrete. If DB Contractor chooses to use entrained air in its structural concrete, the structural concrete shall meet all specification requirements, to include air entrainment requirements.

14 RAIL

Section not used.

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.

TxDOT discretionary landscape and miscellaneous allowances of $100,000 for the Base Scope and $100,000 for the Option shall be included in the Price. DB Contractor may be required to landscape improvements within the Project in a manner that utilizes this discretionary allowance. The items anticipated to be credited against this allowance are trees, shrubs, other plant materials, small streetscape and signs. The cost of furnishing and installing irrigation systems, installing water lines, permits, the cost to irrigate and maintain the landscaped areas, etc. shall be excluded from the discretionary allowance.

All other described aesthetic elements in Section 15 are required elements of the Project and shall not be counted towards the discretionary landscape and miscellaneous 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, 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) Any permanent building construction within the Project, including ancillary support and operational,

l) Light fixture, ambient light colors, and general layout conditions

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.

If an aesthetic concept has not been developed for the Project, DB Contractor shall prepare an aesthetics concept of the Project that provide a design intent of the San Antonio District's Hill Country Theme 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 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 60 Days of issuance of NTP1. The approved aesthetic concept shall be incorporated into the Aesthetics and Landscaping Plan 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. DB Contractor shall submit the Aesthetics and Landscaping Plan(s) to TxDOT for review and approval in its good faith discretion within 120 Days of issuance of NTP1 for the Base Scope and NTP3 for the Option, if the Option is exercised by TxDOT. Approval of the Aesthetics and Landscaping Plan(s) shall be a condition of NTP2 for the Base Scope and NTP4 for the Option, if the Option is exercised by TxDOT.

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

- Aesthetics
  - 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 Utilities as they relate to the location of aesthetic improvements. DB Contractor shall provide composite drawings showing potential conflicts for proposed improvements.
  - e) Color schemes and their locations
- Landscaping
  - a) A plan that indicates plant palettes, locations of plants, plant types, and planting dates
  - b) A maintenance program
  - c) 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 paper copies, in color

d) Eight 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 Landscape Plan(s) is required prior to construction of any Elements affected by the Plan.

The Aesthetics and Landscaping Plan shall comply with the San Antonio District Urban Design Themes for Bexar and Outlying Counties, available at:

http://www.txdot.gov/inside-txdot/district/san-antonio/urban-design.html.

Aesthetics plans shall be signed and sealed by a Texas Registered (or Licensed) Professional Engineer.

15.2.3 Personnel

DB Contractor shall provide a landscape architect, registered in the State of Texas, with a minimum of 5 years of experience in designing aesthetics and landscaping Elements for roadway projects of similar scope and size, to develop the Aesthetics and Landscaping Plan.

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, 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 fit within the regional context.

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 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.

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 other physical features such as structures, landscaping, and other highway components.

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 DB Contractor shall clearly detail and identify how wall patterns shall be incorporated into the chosen design solution.

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.

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 Projects aesthetics concept.

No exposed conduits or drain pipes will be allowed on bents, columns, bridge beams, retaining walls, or any other visible surface.

DB Contractor shall ensure that a constant superstructure depth is maintained throughout the bridge length for all bridges other than direct connection structures and braided ramps. For direct connection structures and braided ramps, concrete beam spans shall be of constant depth throughout the structure.

DB Contractor is not required to enhance Structural Elements not visible by the traveling public with aesthetic treatments.

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 agricultural extension agent of the applicable county and TxDOT for recommended plant species lists. DB Contractor shall use plant species native to the area or naturalized for the Project Site.

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

Vegetation provided as a part of DB Contractor's Aesthetic and Landscaping plan, other than grassing, and erosion control measures, shall be incorporated with the following guidelines:

- Trees, if used shall be placed in accordance with TxDOT's minimum clearance zones and shall be placed in the Facility ROW between mainlanes and frontage roads. Trees shall be a minimum of six (6) feet high and shall have a three (3) inch caliper minimum.
- The mature canopy shall not overhang the travel lane or shoulder of any part of the roadway.

15.3.5 Riprap

Concrete riprap shall be used in hard to reach mowing areas or under structures such as, but not limited to, areas between, near, or next to guard fence posts, sign posts, bent columns, retaining walls, freeway ramp gores, metal beam guard fence, cable barrier, paved ditches, flumes, and ditch inlets to improve roadway appearance. DB Contractor shall comply with the San Antonio District mowstrip standard for riprap design and construction around metal beam guard fence.

Concrete riprap shall be designed and constructed in accordance with the Aesthetics and Landscaping Plan.

15.3.6 Lighting

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

- One pole type for the entire corridor during the construction of the Work. 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.)
- Replacement of adjacent existing landscape lighting, if impacted.

15.3.7 Color Palette

As part of the Aesthetics and Landscaping Plan, DB Contractor shall submit a plan that indicates where each color is to be applied. This plan can be diagrammatic in nature, but shall list each element and its colors. In addition to integrated colors, painting, and staining, DB Contractor may use colored lighting in selected areas to add color.

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 TxDOT *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges* Item 427.4.B.2.d (Form Liner Finish) that comply with the principles, requirements, and strategies established by TxDOT and the approved Aesthetics and Landscaping Plan. TxDOT must review and approve the sample panels before any construction form liners may be ordered, obtained, or used. DB Contractor shall provide sample panels having a textured portion at least 5.0 feet by 5.0 feet with a representative un-textured surrounding surface.

The approved sample panel shall be the standard of comparison for the production concrete surface texture.

For textured panels or concrete surfaces finished with a coating of paint or stain, DB Contractor shall prepare a corresponding coated panel or surface area of an in-place Element for approval prior to the coating operation.

Color samples shall be provided from the Federal Standard 595B Colors Fan Deck. All sample panels shall be representative of the actual panel that will be placed. Primary, secondary and accent colors shall be displayed.

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

The DB Contractor shall design all signing, delineation, pavement marking, and signalization in accordance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD), TxDOT's *Standard Highway Sign Design for Texas* (SHSD), TxDOT's *Sign Crew Field Book*, TxDOT's *Signs and Markings Manual*, TxDOT's *Freeway Signing Manual* and TxDOT's Traffic Engineering Standard Sheets and TxDOT specifications.

Signs on rails and signal details shall comply with San Antonio District standards.

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 prior to commencing Final Design. Before placing any signs, delineation, 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.

DB Contractor's design of delineators and object markers shall comply with TMUTCD requirements.

Signs shall meet the requirements of TxDOT's *Standard Highway Sign Design for Texas*.

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 Not applicable

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.

The company currently under contract with TxDOT for logo signs is Lone Star Logos, whose phone number is (866) 627-5646.

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 Sections 13 (Structures) and 15 (Aesthetics and Landscaping).

DB Contractor shall design sign support structures to provide a vertical clearance of not less than 19' between the high point of the roadway and the bottom of the sign.

If multiple signs are placed on a sign support structure and if vertical size difference between the signs is two feet or less, DB Contractor shall bottom justify the signs.

16.3.7 Pavement Markings

DB Contractor shall ensure that the design and installation of all pavement markings comply with applicable TMUTCD requirements and TxDOT's Traffic Engineering Standard sheets.

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.

Reflectorized pavement markings shall meet the retroreflectivity requirements described in TxDOT Special Specification 8251.

DB Contractor shall use 6" broken reflectorized pavement markings on mainlanes. All other broken reflectorized pavement markings shall be 4".

Contrast pavement markings shall be used on concrete pavement surfaces only.

Reflectorized profile pavement markings shall be utilized on mainlane edge lines.

16.3.8 Signalization

Traffic signal designs and modifications to existing traffic signals shall be completed in accordance with the current TxDOT standards and 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 Project 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 Project Site, and shall provide all communication hardware/equipment for TxDOT or the appropriate local Governmental Entity to communicate with the signal systems within the Project Site.

New or modified traffic signal equipment and installation shall conform to the City of San Antonio standards and requirements.

Temporary and permanent traffic signal plans shall be reviewed and approved by the City of San Antonio prior to installation of the traffic signals.

DB Contractor shall purchase and install traffic signal equipment that is compatible with City of San Antonio equipment and systems.

DB Contractor shall provide both pedestrian and vehicle detectors at all traffic signals within the Project 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.

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 for the Base Scope and NTP3 for the Option, if the Option is exercised by TxDOT, 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 DBA 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 unsignalized intersections located within the limits of the Base Scope, commencing six months after the Base Scope is opened to traffic and DB Contractor shall conduct additional traffic signal warrant studies for all intersections located within the limits of the Option, if exercised by TxDOT, commencing six months after the Option is opened to 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.

Traffic signal support structures shall be mast arms.

16.3.8.5 Traffic Signal Systems

DB Contractor shall provide interconnection systems between new or modified signals and any other signal system within 0.10 miles of the Project 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 Project Site, and shall provide all communication hardware/equipment for TxDOT or the appropriate Governmental Entity to communicate with the signal systems within the Project Site.

DB Contractor shall 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 provide continuous conventional roadway lighting along the northbound and southbound mainlanes within the Project limits. DB Contractor shall also provide safety lighting at ramps and intersections within the Project limits.

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 the photometric data results for all lighted areas within the Project limits to TxDOT for review.

All third-party requests for lighting within the Project Site shall be subject to TxDOT approval.

DB Contractor shall provide an average to minimum uniformity ratio of 3.1, with a minimum lux of 1.85 and an average lux of 6.5 to 8.6 on all traveled roadways to be illuminated.

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 5, 6, 7, and 9 of the TxDOT *Highway Illumination Manual*. At all times during the Term of the DBA, DB Contractor shall maintain safe lighting conditions along the Project roadway.

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 Federal Aviation Administration (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.

16.3.9.1 Additional Requirements

Additional requirements are as follows:

a) DB Contractor must coordinate with the FAA regarding installation of obstruction lights, if any, on a case-by-case basis.

b) 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.

c) The minimum conductor size shall be #8 AWG copper. DB Contractor shall not use duct cable for illumination purposes.

d) 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.

e) If overhead electric lines confine the placement of luminaires, DB Contractor may use special davit-arm luminaires.

f) Minimum inside dimensions for ground boxes shall be 15.25 inches (width) by 28.25 inches (length) by 10 inches (depth).

g) Ground box covers shall be 2-inch-thick (nominal), nonconducting material and labeled "Danger High Voltage Illumination".

h) Riprap aprons shall be provided to ground boxes located in grassy areas.

i) 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.

j) Electrical part of the installation shall be designed and installed in conformance with the National Electrical Code (NEC).

k) Underpass illumination shall be imbedded in pipes.

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.

All installed signs are required to meet the minimum retro-reflectivity values specified in TMUTCD Table 2A-2.3 (Minimum Maintained Retroreflectivity Levels).

16.4.2 Permanent Pavement Marking

DB Contractor shall meet the minimum retroreflectivity values, as described by TxDOT Special Specification 8251, for edge line markings, centerline/no passing barrier line markings, and lane line markings.

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.

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 plans.

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. At all times during the Term, safe lighting conditions shall be maintained along the Project roadway. DB Contractor shall stake each pole location in the field and provide TxDOT 72 hours notice prior to installation of any foundation.

DB Contractor shall remove all old illumination-related cable and conduit that does not have existing pavement or riprap above it; any existing illumination-related cable and conduit that is under the existing pavement or riprap may be abandoned.

DB Contractor shall place all bore pits safely away from traffic, provide positive barrier protection, and provide necessary signs to warn of the construction area.

DB Contractor shall contact Utility Owners regarding their specific required working clearance requirements.

DB Contractor shall affix an identification decal on each luminaire, ground box, and electrical service maintained and/or operated by DB Contractor for inventory purposes and shall submit inventory information to TxDOT in a TxDOT-compatible format. This identification shall denote that these are property of DB Contractor and shall provide a contact phone number and address in the event of Emergency or necessary maintenance.

17 INTELLIGENT TRANSPORTATION SYSTEMS

17.1 General Requirements

An Intelligent Transportation System (ITS) is necessary for monitoring the Project's traffic flow and performance both during construction and as a permanent installation. The Project ITS must accurately detect traffic and traffic operational conditions throughout the Project limits, and clearly communicate relevant and useful travel information to the people using the facility.

The new system provided by the DB Contractor will need to connect to the existing ITS network operated by TxDOT. The Project ITS must be compatible with the in-place system that TxDOT is 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 Base Scope at all times between NTP1 and Final Acceptance of the Base Scope and within the Option, if the Option is exercised by TxDOT, at all times between NTP3 and Final Acceptance of the Option, except for system crossovers that are approved by TxDOT.

DB Contractor shall be responsible for the planning, design and installation of safe and functional ITS for the Project using Good Industry Practice. All components of the ITS shall conform to the provisions of the National Transportation Communication for ITS Protocol (NTCIP) and the ITS Special Specifications and Special Provisions available in the RID.

In addition to the permanent ITS, the DB Contractor shall install and ensure functionality of temporary ITS for the Base Scope within 90 days after NTP2 and for the Option within 90 days after NTP4, if the Option is exercised by TxDOT, that shall be utilized at all times between 90 days after NTP2 and the earlier of operation of the permanent ITS or Base Scope Final Acceptance and, for the Option, within 90 days after NTP4 that shall be utilized at all times between 90 days after NTP4 and the earlier of operation of the permanent ITS or Option Final Acceptance.

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 utilize a conceptual ITS layout developed by TxDOT and available in the RID to prepare a more developed preliminary ITS layout for review and concurrence by TxDOT to ensure adequate planning of the ITS implementation.

DB Contractor shall coordinate with the TxDOT TransGuide office.

Subject to the specific requirements of this Section 17, DB Contractor shall determine the number and specific locations of all ITS components based on Attachment 17-1 Conceptual ITS Layout.

DB Contractor shall provide safe ingress/egress areas and structures to accommodate TxDOT personnel access to ITS components for maintenance and operation activities.

17.2.1 ITS Communications Requirements

DB Contractor shall provide a wireless ethernet radio (WER) communications network. The communications network shall serve the highway ITS components along the highway Elements of the Project. The communications network shall connect to TxDOT's nearest fiber optic cable network, which is located near the intersection of Loop 1604 and SH 16 (Bandera Road). DB Contractor shall install a communications network in accordance with Attachment 17-1.

DB Contractor shall install WER equipment in accordance with the ITS Special Specifications and Special Provisions available in the RID.

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.

DB Contractor shall repair each communication cable or electrical conductor that is severed or otherwise rendered not usable.

DB Contractor shall use departmental material specifications for conduit and ground box types.

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. DB Contractor shall take delivery of CCTV cameras furnished by TxDOT. DB Contractor shall include a task in its Project Schedule for delivery of TxDOT furnished CCTV cameras and provide a minimum of 90 days notice to TxDOT for retrieval of the TxDOT furnished CCTV cameras.

DB Contractor shall install the CCTV field equipment in accordance with the ITS Special Specifications and Special Provisions available in the RID.

17.2.3.1 Equipment

DB Contractor shall take delivery of all necessary TxDOT furnished CCTV equipment, including cameras, camera controls, cables and connections. DB Contractor shall include a task in its Project Schedule for delivery of TxDOT furnished CCTV equipment and provide 90 days notice to TxDOT for retrieval of the TxDOT furnished CCTV equipment. TxDOT shall make available the TxDOT furnished CCTV equipment to DB Contractor within 90 days after receipt of notice from DB Contractor.

DB Contractor shall inform TxDOT in writing 6 months prior to the expected initiation of ITS installation. 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, and if necessary convertible for use by TxDOT's in-place ITS network.

17.2.3.2 Placement

DB Contractor shall provide overlapping roadway coverage by CCTV cameras for all highway lanes and intersecting cross streets within the Project limits to provide redundant camera field of view. CCTV cameras shall be placed 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.

Distance between CCTV cameras shall not exceed 1.5 miles.

CCTV camera poles shall be placed as close as possible to the highpoint of overpasses. CCTV camera poles shall be 55 feet in height and conform to the ITS Special Specifications and Special Provisions available in the RID.

DB Contractor shall provide path analysis for wireless connections.

17.2.3.3 Video Requirements

DB Contractor shall install and ensure functionality of state-of-the-art CCTV cameras that meet the requirements in the ITS Special Specifications and Special Provisions available in the RID. At any time prior to Final Acceptance, should any CCTV cameras fail to meet the criteria in the ITS Special Specifications and Special Provisions available in the RID, DB Contractor shall notify TxDOT within 24 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 weather condition criteria in the ITS Special Specifications and Special Provisions available in the RID.

17.2.3.5 Control Requirements

DB Contractor shall provide cameras and related equipment capable of operating with the pan-tilt unit requirements in the ITS Special Specifications and Special Provisions available in the RID.

17.2.4 Vehicle Detection

Bluetooth readers (used to provide travel speeds and travel times) and radar vehicle sensing devices (used to provide travel speeds, traffic volumes and vehicle classifications) shall be installed approximately in the locations shown in Attachment 17-1. 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 using radar vehicle sensing devices (RVSD). The RVSD units shall meet the requirements in the ITS Special Specifications and Special Provisions available in the RID. The detectors shall be non-intrusive to the roadway users.

Vehicle detection sensors shall determine vehicle speed for each vehicle passing the sensor.

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.

DB Contractor shall install Bluetooth readers that are fully compatible with TxDOT's existing Bluetooth application which uses the Post Oak Anonymous Wireless Address Matching (AWAM) System to detect vehicles equipped with enabled Bluetooth networking devices, including cellular phones, mobile GPS systems, telephone headsets and in-vehicle navigation and hands-free systems. The AWAM reader shall read the unique 48-bit address, known as a MAC address, used to identify enabled devices. The reader shall then store the MAC address and transmit the data back to TransGuide using the WER communications (permanent system) or the leased T-1 communications (temporary system).

17.2.5 Dynamic Message Signs (DMS)

DB Contractor shall install and ensure functionality of LED technology electronic DMS in locations shown on in Exhibit 17-1.

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 ITS Special Specifications and Special Provisions available in the RID and DB Contractor 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.

DB Contractor shall take delivery of DMS furnished by TxDOT. DB Contractor shall include a task in its Project Schedule for delivery of TxDOT furnished DMS and provide 90 days notice to TxDOT for retrieval of the TxDOT furnished DMS. TxDOT shall make available the TxDOT furnished DMS to DB Contractor within 90 days after receipt of notice from DB Contractor.

17.2.6 –Not Used

17.2.7 –Not Used

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. DB Contractor shall connect the project ITS network to the existing TxDOT fiber hub at the northeast corner of the intersection of Loop 1604 and SH 16 (Bandera Road).

17.2.9 Wrong Way Driver Countermeasures

The contractor shall install both mainlane and entrance ramp wrong way countermeasures. DB Contractor shall install one LED illuminated mainlane system in each direction according to TxDOT standards and specifications. The mainlane wrong way system shall consist of one LED illuminated wrong way sign and one wrong way blank out sign mount preferably on the upstream legs of an overhead sign bridge (both inside and outside). The mainlane system signs shall be activated by an RVSD placed a minimum of 600 ft. upstream of the sign, when a wrong way driver is detected, and shall remain activated for the time it would take a vehicle traveling 30 mph to travel from the RVSD to the signs. DB Contractor shall install LED illuminated wrong way signs and one RVSD configured to detect wrong way movements only on each exit ramp. The exit ramp signs shall be configured to activate at night and during low light conditions. The exit ramp RVSD units shall be connected to the TransGuide Operations Center using the WER communications network. DB Contractor shall take delivery of LED illuminated wrong way signs and radar units furnished by TxDOT. DB Contractor shall include a task in its Project Schedule for delivery of TxDOT furnished LED-illuminated wrong-way signs, RVSDs and blank out signs and provide 90 days notice to TxDOT for retrieval of the TxDOT furnished LED-illuminated wrong-way signs, RVSDs and blank out signs. TxDOT shall make available the TxDOT furnished LED-illuminated wrong-way signs, RVSDs and blank out signs to DB Contractor within 90 days after receipt of notice from DB Contractor. The mainlane system and the exit ramp equipment shall be installed in accordance with the ITS Special Specifications and Special Provisions available in the RID.

17.2.10 Temporary ITS

The DB contractor shall provide temporary ITS based on Attachment 17-1. The DMS, CCTV cameras, CCTV poles, and Bluetooth readers installed for the temporary ITS system shall be relocated to be part of the permanent ITS at the end of the project. The temporary ITS equipment installed near Bandera Road shall be connected to the existing TxDOT fiber optic cable network at Bandera Road. The temporary ITS equipment installed at all other locations shall be connected to the TransGuide Operations Center using leased T-1 service. TxDOT shall have the option of taking possession of any temporary ITS equipment that is not used for the permanent ITS. Any temporary ITS equipment that is not accepted by TxDOT shall be the property of the DB contractor.

DB Contractor shall take delivery of T-1 Ethernet Extender equipment furnished by TxDOT. DB Contractor shall include a task in its Project Schedule for delivery of TxDOT furnished T-1 Ethernet Extender equipment and provide 90 days notice to TxDOT for retrieval of the TxDOT furnished T-1 Ethernet Extender equipment. TxDOT shall make available the TxDOT furnished T-1 Ethernet Extender equipment to DB Contractor within 90 days after receipt of notice from DB Contractor. T-1 Ethernet Extender equipment shall conform to the ITS Special Specifications and Special Provisions available in the RID.

17.2.11 Summary of TxDOT Furnished ITS Equipment

The following equipment is TxDOT furnished ITS equipment:

a) CCTV equipment, complying with the requirements of Section 17.2.3;

b) DMS, complying with the requirements of Section 17.2.5;

c) LED-illuminated wrong-way signs, complying with the requirements of Section 17.2.9;

d) RVSDs, complying with the requirements of Section 17.2.9;

e) blank out signs, complying with the requirements of Section 17.2.9;

f) Ethernet Switch – Teleste Corp. – Mod. MPCSFXX-XXXXX-X-S1/CPS253;

g) SFP Transceiver – Teleste Corp. – Mod. MSF214A (30km);

h) Ethernet MPEG4 Encoder – Teleste Corp. – Mod. MPC-E1/CPS253;

i) Terminal Server – Digi International – Mod. Portserver TS4 H MEI;

j) Bluetooth Reader – BAT Products – Mod. BAT-433;

k) CIP-3 Camera Interface Panel (Surge Suppression) – Manufactured by Computerized Traffic Control, Inc.; and

l) T-1 Ethernet Extender equipment, complying with the requirements of Section 17.2.10.

DB Contractor shall install and assure the functionality of all TxDOT furnished ITS equipment in accordance with Section 17.3 below. DB Contractor shall supply all other ITS equipment.

DB Contractor shall take delivery of TxDOT supplied equipment at a location specified by TxDOT. DB Contractor shall include a task in its Project Schedule for delivery of TxDOT furnished ITS equipment and provide 90 days notice to TxDOT for retrieval of the TxDOT furnished ITS equipment. TxDOT shall make available the TxDOT furnished ITS equipment to DB Contractor within 90 days after receipt of notice from DB Contractor.

As part of DB Contractor's notice to TxDOT for retrieval of the TxDOT furnished ITS equipment, DB Contractor shall notify TxDOT of the specific location for DB Contractor retrieval of the TxDOT furnished ITS equipment. The specific location shall be within 10 miles of the Project, secure, and provide protection from the weather.

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 notify TxDOT of non-functioning equipment furnished by TxDOT within one (1) day of determination of the non-functioning equipment.

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.

18 TRAFFIC CONTROL

18.1 General Requirements

DB Contractor shall design and construct the Project, in conformance with the requirements stated in this Section 18, to provide for the safe and efficient movement of people, goods, and services, through and around the Project, while minimizing negative impacts to Users, residents, and businesses. DB Contractor shall coordinate with local government entities 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, colleges/universities, business owners (including Fiesta Texas and Sea World), 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 signs, pavement markings, pavement markers 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 for coordinating the temporary ITS with the TxDOT TransGuide office

h) 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

i) Procedures and process for the safe ingress and egress of construction vehicles in the work zone

j) Provisions to provide continuous access to established truck routes and Hazardous Material (HazMat) routes, and to provide suitable detour routes, including obtaining any approvals required by the appropriate governmental entities for these uses

k) 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

l) 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

m) Descriptions of contact methods, personnel available, and response times for any deficiencies or Emergency conditions requiring attention during off-hours

n) Procedures for night work (from 30 minutes before dusk to 30 minutes after dawn) to include a work zone light system design in accordance with NCHRP Report 498 – *Illumination Guidelines for Nighttime Highway Work*

o) 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.

p) DB Contractor shall utilize uniformed police officers to effect mainlane closures.

The TMP must be approved by TxDOT prior to the start of construction activities. DB Contractor shall provide TxDOT sufficient time for review of, and comment on, the TMP. TxDOT retains the right to require revision and re-submittal of the TMP within a reasonable amount of time.

18.3 Design Requirements

18.3.1 Traffic Control Plans

DB Contractor shall use the procedures in the TMP and the standards of the TMUTCD to develop detailed traffic control plans which provide for all construction stages and phasing, as well as all required switching procedures.

DB Contractor shall produce a traffic control plan for each and every phase of Work that impacts traffic and involves traffic control details and shall coordinate with appropriate Governmental Entities on the development of the plan. DB Contractor is responsible for obtaining all necessary permits from such local entities to implement the plans. Traffic control plans shall be signed and sealed by a Texas Registered (or Licensed) Professional Engineer

Each traffic control plan shall be submitted to TxDOT for review a minimum of 10 Days prior to implementation. The traffic control plan shall include details for all detours, traffic control devices, striping, and signage applicable to each phase of construction. Information included in the traffic control plans shall be of sufficient detail to allow verification of design criteria and safety requirements, including typical sections, alignment, striping layout, drop off conditions, and temporary drainage. The traffic control plans shall clearly designate all temporary reductions in speed limits. Changes to posted speed limits will not be allowed unless specific prior approval is granted by TxDOT.

Opposing traffic on a normally divided roadway shall be separated with appropriate traffic control devices in accordance with Good Industry Practice and TMUTCD based on roadway design speed**.** Approved traffic control devices can be found in the *Compliant Work Zone Traffic Control Device List* (CWZTCD list).

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.

Each traffic control plan shall be submitted to TxDOT for review a minimum of 10 Days prior to implementation.

18.3.1.1 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 the existing posted speed limit or greater, except for major alignment transitions, where the design speed may be reduced by 10 miles per hour (mph) if approved by TxDOT in its sole discretion.

Number of Lanes. The minimum number of mainlanes to be maintained shall be the number of mainlanes 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.

18.3.1.2 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 Closure. DB Contractor shall not reduce the number of mainlanes below the current number of mainlanes during Peak Times. DB Contractor may lower the number of roadway lanes in each direction during Off-Peak Times provided that a minimum of two roadway controlled access lanes in each direction are maintained. DB Contractor shall be assessed $10,000 per lane for the first minute of every hour during Peak Times in which all lanes are not open to traffic.

DB Contractor shall seek TxDOT approval if a reduction in the current number of frontage road or arterial street lanes are required.

If bridge work cannot be accomplished safely within these requirements, DB Contractor may utilize weekend road closures between 10:00 pm Friday and 5:00 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. DB Contractor shall be assessed $10,000 per lane for the first minute of every hour after 5:00 am Monday in which all lanes are not open to traffic.

Any complete roadway closure will require a Traffic Control Plan to be submitted and approved by TxDOT.

Ramp Closures. DB Contractor shall not close two consecutive entrance or two consecutive exits at the same time.

Driveway Closures. DB Contractor shall maintain a minimum of one driveway per business and residence at all times. For businesses with multiple driveways, when driveway closure is necessary to

progress Work, no driveway may be closed for more than 30 consecutive days or more than 45 days in a 90-day period.

18.3.1.3 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.

18.3.2 Restricted Hours

A. 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 or expected traffic conditions may warrant.

a) Easter Holiday Weekend (Friday through Sunday)

b) Memorial Day Weekend (Friday through Monday)

c) Independence Day (July 3 through noon on July 5)

d) Labor Day Weekend (Friday through Monday)

e) Thanksgiving Holiday (Wednesday through Sunday)

f) Christmas and New Year's Holiday (December 15 through January 1)

B. Event Restrictions

No lane closure that restricts or interferes with traffic shall be allowed for the regional events set forth below. 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.

a) Northside ISD and Northeast ISD Spring break week (Saturday through the following Sunday)

b) Tax-free shopping weekend (Saturday and Sunday)

c) Fiesta San Antonio week (Saturday through the following Sunday)

18.4 Construction Requirements

Construction shall be in accordance with DB Contractor's TMP, the manufacturer's directions or recommendations where applicable, and the applicable provisions of the TMUTCD.

18.4.1 DB Contractor Responsibility

If at any time TxDOT determines DB Contractor's traffic control operations do not meet the intent of the TMP or any specific traffic control plan, DB Contractor shall immediately revise or discontinue such operations to correct the deficient conditions.

DB Contractor shall provide TxDOT the names of the Traffic Control Coordinator and support personnel, and the phone number(s) where they can be reached 24 hours per day, seven 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 completely obscures the existing marking but does not materially damage the surface or texture of the pavement. Pavement marking removal by over-painting is prohibited.

Contrast pavement markings shall be used on concrete pavement surfaces only.

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 maintain the Project in a manner that provides a safe and reliable transportation system for improved mobility.

19.1.1 General Maintenance Obligations

DB Contractor shall take all necessary actions to achieve the following during Construction Work:

a) Maintain the Construction Work and Site in a manner appropriate for a facility of the character of the Project.

b) Minimize delay and inconvenience to Users and, to the extent DB Contractor is able to control, users of adjacent facilities.

c) Identify and correct all defects and damages from Incidents within the Project ROW.

d) Monitor and observe weather and weather forecasts to proactively deploy resources to minimize delays and safety hazards due to heavy rains, snow, ice, or other severe weather events.

e) Remove debris, including litter, graffiti, animals, and abandoned vehicles or equipment from the Project ROW.

f) Minimize the risk of damage, disturbance, or destruction of third-party property during the performance of maintenance activities.

g) Coordinate with and enable TxDOT and others with statutory duties or functions in relation to the Project or adjacent facilities to perform such duties and functions.

h) Perform systematic Project inspections, periodic maintenance, and routine maintenance in accordance with the provisions of DB Contractor's Maintenance Management Plan and DB Contractor's Safety and Health Plan.

DB Contractor is responsible for providing all resources necessary for the performance of all activities in the Maintenance Management Plan.

The Performance and Measurement Table Baseline is included as Table 19-1 in Attachment 19-1, Performance and Measurement Table Baseline.

19.2 Maintenance Management Plan (MMP)

DB Contractor shall prepare a Maintenance Management Plan (MMP) that is consistent with the general maintenance obligations described in Section 19.1 (General Requirements) and defines the process and procedures for the maintenance of the Project for the Term of the DBA. The MMP shall include performance requirements, measurement procedures, threshold values at which maintenance is required, inspection procedures and frequencies, and subsequent maintenance to address noted deficiencies, for each physical Element of the Project in accordance with Table 19-1, including impacts to adjacent facilities. 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 Baseline, 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. DB Contractor shall update this plan as required, or at least annually.

The MMP shall include procedures for managing records of inspection and maintenance activities, including appropriate measures for providing protected duplication of the records. Inspection and

maintenance records shall be kept for the Term of the DBA and shall be provided to TxDOT at the time the Project is delivered to TxDOT, at either the expiration of the Term or earlier termination of the DBA.

DB Contractor shall submit the MMP to TxDOT for review and approval at least 60 Days prior to the issuance of NTP2. Approval by TxDOT of the MMP shall be a condition of NTP2.

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 DBA.

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.

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

g) Five feet offset for through movement of bicycle traffic from raised concrete island at intersections.

Cross streets may have existing bicycle facilities that shall be maintained and functioning during construction.

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 the *Texas Accessibility Standards*. 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(s)

DB Contractor shall meet AASHTO's *A Policy on Geometric Design of Highways and Streets* requirements for sight distances within pedestrian sight triangles.

DB Contractor is responsible for obtaining Texas Department of Licensing and Regulation (TDLR) reviews and approvals of pedestrian facility design and construction.

DB Contractor may utilize existing sidewalks. If existing sidewalks are utilized, DB Contractor shall ensure that the existing sidewalks meet the requirements of Section 20.3.2, are free of defects and meet the requirements for Final Acceptance.