Texas Department of Transportation

Texas Turnpike Authority

PROGRAMMATIC

COMPREHENSIVE DEVELOPMENT AGREEMENT

BOOK 3

(Design-Build)

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1 GENERAL

2 PROJECT MANAGEMENT

Developer 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 describing discrete Elements of the Work. The Project Management Plan is an umbrella document that describes Developer's managerial approach, strategy, and quality procedures to design, build, operate, and maintain the Project and achieve all requirements of the CDA Documents.

The structure of the Project Management Plan is outlined in Table 2-1.

Table 2-1: Elements of the Project Management Plan

PMP Chapter	Chapter Title	Section of Book 2 That Define the Chapter Requirements
1	**Project Administration**	Section 2
2	**Quality Management Plan**	Section 2
2A	Design Quality Management Plan	Section 2
2B	Construction Quality Management Plan	Section 2
2C	Maintenance Management Plan	Section 2; Section 19
3	**Comprehensive Environmental Protection Plan**	Section 4
4	**Public Information and Communications Plan**	Section 3
5	**Safety Plan**	Section 2
6	**TxDOT – Developer Communications Plan**	Section 2
7	**Right of Way Acquisition Plan**	Section 7

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

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

2.1 Administrative Requirements

2.1.1 Project Schedule

2.1.1.1 General Requirements

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

2.1.1.2 Required Submittals

2.1.1.2.1 Baseline Schedule

Developer shall use the preliminary schedule submitted with the Proposal as a foundation to prepare a Project Baseline Schedule and shall submit a draft of the Project Baseline Schedule to TxDOT for review and approval. Approval of the Project Baseline Schedule shall be a condition of NTP2. Developer shall submit a single hardcopy of the Project Baseline Schedule on full-size (24" x 36") color plot sheets, along with an electronic version of the schedule in its native format. Developer shall be responsible for updating scheduling software to maintain compatibility with current TxDOT-supported scheduling software.

The Project Baseline Schedule shall include a separate narrative report which describes, in general fashion, Developer's proposed methods of operation for designing and constructing the major portions of the Work required by the CDA 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 Project Baseline Schedule shall include all major Work activities required under the CDA Documents, in sufficient detail to monitor and evaluate design and construction progress, from commencement of the Work to Final Acceptance of the Work. The Project Baseline Schedule 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, Developer shall indicate the duration (in Days) required to perform the activity and the anticipated beginning and completion date of each activity. In addition, the Project Baseline Schedule shall indicate the sequence of performing each major activity and the logical dependencies and inter-relationships among the activities.

The Project Baseline Schedule shall include a listing of all submittals as called out in the CDA Documents. Submittal activity durations shall include specific durations for TxDOT review and/or approval of Developer's submittals as called out elsewhere in the Agreement and these Technical Provisions.

With the exception of activities relating to Environmental Approvals by Governmental Entities, each activity depicting Developer'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 Developer 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 Project Baseline Schedule 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."

Developer shall allocate the total contract price and quantities throughout the Project activities in the Project Schedule. Such allocation shall accurately reflect Developer'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 Developer's first monthly Project Schedule Update(s) and submitted with Developer'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. Developer shall establish a WBS in line with the WBS

shown in Attachment 2-2 with clearly identifiable linkage between the Price Proposal and Developer-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 Book 2). 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, Developer shall provide a list of Work items that are included in each Project activity or Work Element.

2.1.1.2.2 Project Status Schedule Updates

Developer shall update, on at least a monthly basis, the approved Project Baseline Schedule 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 Project Baseline Schedule. 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.

2.1.2 Document Management

Developer shall establish and maintain an electronic document control system to store, catalog, and retrieve all Project-related documents in a format compatible with Texas Reference Marker System. Unless otherwise directed by TxDOT, record retention shall comply with the requirements of the Texas State Records Retention Schedule, and shall be provided to TxDOT at the time of the expiration or earlier termination of the Agreement.

Maintenance records shall utilize the same format TxDOT utilizes for its statewide asset inventory and condition assessments and shall be capable of being integrated into TxDOT's Maintenance Management Information System (MMIS).

2.1.2.1 Document Storage and Retrieval Requirements

Developer shall describe procedures and processes in the PMP for the storage and retrieval of documents, including the following:

1. Methods by which all documents issued and received by Developer will be uniquely coded and retrievable in a user-friendly format.
2. The routing, filing, control, back-up and retrieval methods for all documents.
3. Methods to facilitate sharing of data including procedures and software for accessing all documents.
4. Methods to code documents. The data elements, at a minimum, shall include: document class, document type/subtype, document name, form number, TxDOT records series item number, TxDOT agency item number, TxDOT records series title, TxDOT retention period, turnover media, turnover frequency, submission type, submission source, and special requirements/remarks.

2.1.2.2 Electronic Document Management System (EDMS)

Developer shall develop and implement an Electronic Document Management System (EDMS). Additionally Developer shall:

- 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.
- Provide a secure location for any interface as may be provided by TxDOT, such that only authorized users and maintenance personnel have access and that it is protected from theft, damage, unauthorized or malicious use.
- Employ appropriate standards and procedures, and train Developer personnel to operate any TxDOT data management system which TxDOT may require in connection with the Project.
- Provide a mechanism for the electronic transfer of meta data along with the associated document file format images for uploading into an electronic document management system (EDMS) employed by TxDOT.
- Provide TxDOT with procedures and software for accessing all documents generated under the CDA Documents.

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

2.2 Quality Management Plan

Developer shall develop, implement, and maintain a comprehensive Quality Management Plan that is consistent with and expands upon the preliminary Quality Management Plan submitted with the Proposal. The Quality Management Plan shall comply with ISO 9001:2000, or most current version, as updated by the International Standards Organization, as of the Proposal Due Date. Developer may elect to obtain formal ISO 9001 certification, but will not be required to do so.

2.2.1 General Requirements

Developer 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 CDA Documents and provides documented evidence of same.

The complete Quality Management Plan shall incorporate the following features:

- Developer shall make all quality records immediately available to TxDOT and the Independent Engineer for review. Developer shall provide TxDOT or the Independent Engineer with a copy of any and/or all quality records when requested.
- The Quality Management Plan shall encompass all Work performed by Developer and Contractors of all tiers.
- Developer shall submit to the Independent Engineer and TxDOT the results of all internal audits within seven Days of their completion.
- Developer shall promptly submit to the Independent Engineer and TxDOT non-conformance reports both upon issuance and resolution.

The Quality Management Plan shall contain detailed procedures for Developer's quality control and quality assurance activities. Developer's quality process shall incorporate planned and systematic verifications and audits undertaken by an independent party. Developer 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 CDA Documents.

Inspections, reviews, and testing shall only be performed by personnel with appropriate training and qualifications, using appropriate equipment that is accurately calibrated and maintained in good operating condition at an AMRL (AASHTO R18, "Establishing and Implementing a Quality System for Construction Materials Testing Laboratories") accredited facility, or at a facility with comparable certification (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 CDA Documents, shall have the meaning defined in ISO 9001. Terms used in ISO 9001 shall have the meanings defined below:

- Organization: Developer's organization, including any Affiliates and Contractors.
- Customers: the Users of the roadways, TxDOT, Customer Groups, and key stakeholders that have an adjacent property interest or connecting roadway.
- Product: the Work.

2.2.3 Quality Management Organization

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

- The organizational chart that identifies all quality management personnel, their roles, authorities and line reporting relationships.
- Description of the roles and responsibilities of all quality management personnel and those who have the authority to stop Work.
- 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.
- 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 Developer will implement throughout its organization. The policy shall demonstrate Developer 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 and frequency of testing, that Developer will use to meet quality control and quality assurance requirements of the Work

Developer 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 either the Independent Engineer or TxDOT advises Developer of such a problem.

2.2.6 Responsibility and Authority of Developer 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.

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

The Quality Manager shall prepare a monthly report of the quality inspections and tests performed, results of such inspections and tests, and occurrences and resolution of non-conformance discoveries. Developer shall submit the monthly reports to the Independent Engineer and TxDOT for review.

Developer's Quality Manager, quality assurance manager, and quality control manager(s) shall have the authority to stop Work for quality-related issues.

2.2.7 Design Quality Management Plan

Developer's Final Design shall not deviate from but shall expand upon the preliminary design submitted with Developer's Proposal.

2.2.7.1 Released for Construction Documents

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

2.2.7.2 Record Drawings and Documentation

The Record Drawings and Documentation shall be an organized, complete record of Plans and supporting calculations and details that accurately represent what Developer constructed.

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

2.2.8 Construction Quality Management Plan

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

2.2.9 Maintenance Management Plan

Section 19 (Maintenance) includes requirements for maintenance management.

2.3 Comprehensive Environmental Protection Plan

Section 4 (Environmental) includes requirements for environmental management.

2.4 Public Information and Communications Plan

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

2.5 Safety Plan

Developer shall be responsible for the safety of its personnel and of the general public affected by the Project.

Developer shall develop, implement, and maintain a comprehensive safety plan ("Safety Plan") that is consistent with and expands upon the preliminary safety plan submitted with the Proposal. The Safety Plan shall fully describe Developer's policies, plans, training programs, Work Site controls, and Incident response plans to ensure the health and safety of personnel involved in the Project and the general public affected by the Project during the Term of the Agreement.

Developer's Safety Plan shall address procedures for immediately notifying TxDOT of all Incidents arising out of or in connection with the performance of the Work, whether on or adjacent to the Project.

2.6 TxDOT-Developer Communications Plan

Developer shall develop, implement, and maintain a TxDOT–Developer Communications Plan (Communications Plan) that is consistent with and expands upon the preliminary communications plan submitted with the Proposal. Developer shall maintain and update the Communications Plan throughout the Term.

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

The Communications Plan shall describe how Developer's organization will respond to unexpected requests for information, communicate changes or revisions to necessary Developer personnel, and notify affected stakeholders before and after changes are made to the CDA 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 Developer, and are not part of this review process. The reviewing surveyor shall review the survey document package and return his comments to Developer in a timely manner. Developer 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).

2.8 Deliverables

2.8.1 Project Management Plan

Developer **shall submit** a Project Management Plan to TxDOT for approval in accordance with the requirements of Attachment 2-1 and Section 2 of Book 2.

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3 PUBLIC INFORMATION AND COMMUNICATIONS

3.1 General Requirements

It is vital to the success of the Project that TxDOT and Developer gain and maintain public support. The public will better support TxDOT and Developer if they are kept abreast of Project information in a timely manner, are notified in advance of potential impacts, have an opportunity to identify issues and recommend solutions, receive timely and appropriate feedback from Developer, and perceive a high-quality, well executed communications plan for keeping them informed, engaged, and educated.

This Section 3 describes the requirements with which Developer shall comply during the Term of the Agreement regarding the provision of information and communication with the Customer Groups.

3.2 Administrative Requirements

3.2.1 Public Information and Communications Plan

Developer shall prepare a comprehensive Public Information and Communications Plan (PICP), based upon the preliminary communications plan submitted with Developer's Proposal, which informs, educates, and engages the Customer Groups throughout every stage of the Project. In preparing this plan, Developer shall identify the Customer Groups and develop specific plans to respond to their concerns and needs in all respects regarding the Project. After incorporation of comments from TxDOT on the plan, Developer shall implement the various activities and initiatives contained therein. Developer shall continually maintain the plan to ensure delivery of high-quality, well executed communications throughout the Term of the Agreement.

The PICP shall be flexible to capture the full magnitude of yet-to-be-determined impacts from Project activities such as design, construction, and maintenance, and the public's reaction to these and other impacts. The PICP shall also be resilient to successfully implement the outlined strategies, given the ever-changing desire for depth, breadth, and frequency of information by a variety of important Customer Groups such as the media, elected officials, and the general public.

The PICP shall include a general timeline listing public information activities for the Project over the entire Term of the Agreement.

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

Developer shall provide sufficient qualified staffing to effectively implement the PICP.

In developing the PICP, Developer shall make appropriate provisions to achieve the following:

Public Liaison

- Gain and maintain public support, building on existing community partnerships and communication networks.
- Provide the public with opportunities for input.
- Demonstrate to the public that the Project will be developed pursuant to a well-executed program.
- Notify the public in advance of key Project ROW acquisition, construction, and maintenance activities and communicate the potential impacts of these activities.

- Develop, disseminate and display timely, high-quality, innovative, user-friendly, accurate and appropriate community information including exhibits showing slope grading, drainage, bridge structures, retaining walls, sound walls, and Project ROW acquisition.
- Develop and manage a public relations campaign and communication strategy to convey key messages, branding and pertinent information about the Project.

Customer Groups

- Develop a forum to coordinate on-going dialogue among Customer Groups, TxDOT, and Developer.
- Prepare and distribute Project-related materials in a user friendly format to inform Customer Groups through appropriate means such as: meetings, interviews, media kits, news releases, telephone correspondence, newsletters, brochures, e-mail, hotlines, Highway Conditions Reports (HCRs), dynamic message boards, Web alerts, public opinion polls/surveys, videos, display booths, presentations, public access information kiosks, and special events.
- Organize and manage meetings with key elected officials, the general public, representatives of civic organizations, businesses, and special interest groups along the Project corridor (individually or in groups) for the purpose of building rapport with affected stakeholders.

Media

- Build on existing TxDOT media resources and/or create and develop advertising messages, including graphics, logos, and slogans.
- Place Project-related messages in the appropriate media.
- Develop and distribute public service announcements, paid advertising, and news reports.
- Manage media relations with key transportation and business reporters and prepare and distribute news releases and media kits.

Environmental

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

3.2.2 Public Information Coordinator

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

- Provide the primary point of contact between Developer and the public and act as clearinghouse for the receipt and response to written or verbal complaints regarding the Project.
- Lead the production, implementation, audit, quality control/quality assurance and update of the PICP.
- Coordinate and supervise day-to-day activities of Developer's personnel in performing the activities described in the PICP.
- Facilitate communication among Developer, TxDOT personnel (including TxDOT's Public Information Officers), and Customer Groups.
- Interact with affected Customer Groups and represent the interests of the Project at associated public meetings and other formal and informal occasions.
- Develop a "first-hand feel" for public concerns and reactions regarding the Project and public information program and incorporate that knowledge into improving the PICP.

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

3.2.3 Public Information Office

Developer shall maintain a public information office for the Term of the Agreement. The hours of operation for this office shall be as outlined in Book 2, Section 3.2.3. This office shall serve as the primary business location for the Public Information Coordinator and shall be conveniently located to the Project Site. The public information office shall facilitate the exchange of information between Developer and the public and provide a centralized location for residents and other Customer Groups to obtain information on the Project, including Project maps and Plans, alternative routes, lane closures, construction updates, community impacts, and commute options.

In addition to the services listed above, Developer shall provide a 24-hour telephone hotline, manned during normal business hours of the public information office, with a recorded message describing Emergency procedures after hours.

3.2.4 Customer Groups

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

- Media
- Governmental Entities, including regulatory and law enforcement agencies
- General public residing or working within the general vicinity of the Project, or traveling within or across the limits of the Project
- Business owners within or adjacent to the Project corridor
- Utilities, railroads, transportation authorities and providers (such as local airports, transit operators, toll authorities, and other highway concessionaires) affected by the Project

3.2.5 Public Meetings

Developer shall organize and manage meetings with the Customer Groups during design and construction activities.

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

- Design and construction issues affecting adjacent residential areas, frontage roads, local streets, and utilities, including such issues as Project ROW definition, Project ROW acquisition process, grading, drainage, and noise and retaining walls
- Street and roadway detour design and implementation
- Scheduling and duration of Work, including hours of construction
- Haul routes
- Methods to minimize noise and dust
- Environmental mitigation measures

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

3.2.6 Meeting Minutes

For all meetings with the public which Developer conducts or directly participates in, Developer shall prepare meeting minutes within five Business Days after the conclusion of such meetings. At a minimum, Developer 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)

3.2.7 Emergency Event Communications

For all Emergency events, such as vehicle collisions, ice/snow conditions, and Hazardous Material spills, the Public Information Coordinator shall take timely and appropriate action to inform TxDOT and appropriate Customer Groups of all pertinent details. The Public Information Coordinator shall provide these details through the use of appropriate tools to ensure effective communication. These tools include: dynamic message signs (DMS), TxDOT's Highway Conditions Report (HCR), email/Web alerts, telephone notification, facsimiles, and media releases/interviews, as appropriate. The Public Information Coordinator shall continue to provide updated information, as available and on a timely basis, until the Emergency no longer exists.

In the event of an unforeseen Emergency, timely notification shall mean as soon as practicable, but in no event longer than within one hour of the occurrence. If advance 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 was available. In both situations, the Public Information Coordinator shall continue to provide updated information, as available and on a timely basis, until the Emergency no longer exists.

3.2.7.1 Lane Closures

Subject to the lane closure restrictions set forth in Section 18 (Traffic Control), Developer shall provide TxDOT and appropriate Customer Groups a minimum of two weeks advance notice for lane closures and/or traffic switches planned to be in effect longer than 24 hours, and a minimum of 24 hours advance notice for lane closures that are planned to be in effect less than 24 hours, using all appropriate tools as needed. The Public Information Coordinator shall input all lane closures (or an event that results in lane closures) into the TxDOT HCR.

3.2.8 Disseminating Public Information

Developer shall prepare and appropriately distribute materials regarding Project-related subjects, using all appropriate methods, including: meetings, news releases, telephone correspondence, newsletters, email, hotlines, HCR, dynamic message signs, Web alerts, maps, displays, renderings, presentations, brochures, and pamphlets.

Developer shall create a public Web site to convey Project-related information, including:

Contact information
Project maps
Frequently asked questions (FAQs)
Current Project activities addressing design, construction, and maintenance
Timing of street and ramp closures and openings
Recommended route alternatives during closures
Special events calendar
Public comment repository
Links to TxDOT HCRs

Links to other related sites as deemed appropriate by TxDOT

The Web site shall also contain other general Project-related information that enhances the engagement or education of the general public. Developer shall regularly review and update information on this public Web site throughout the Term of the Agreement to provide current and appropriate information.

All written materials produced for Customer Groups shall follow the *Publications Style Guide* published by the TxDOT Public Information Office and/or other appropriate spelling/writing guidelines.

Developer, working collaboratively with TxDOT, shall assess the need for multi-lingual communications and, where appropriate, furnish Project-related materials in non-English languages or other demographic adaptations

3.3 Deliverables

3.3.1 PICP

At least 60 days prior to NTP2, Developer shall submit the PICP for TxDOT approval. Submittal shall be in both hardcopy form and electronic format compatible with TxDOT software. TxDOT approval of the PICP shall be a condition of issuing NTP2.

3.3.2 Meeting Minutes

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

4 ENVIRONMENTAL

4.1 General Requirements

The Developer shall deliver the environmental commitments required by the RFP, CDA Documents, Environmental Laws, Governmental Entities, Governmental Approvals, and all applicable federal and state Laws and regulations. To that end, the Developer 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 Developer 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 effectively demonstrate in detail the Developer's knowledge of all applicable project-specific Environmental Approvals, issues, and commitments and applicable Environmental Laws as set forth in Book 2, and shall describe the processes that will be followed during the course of the Work to comply with those Environmental Approvals, issues, and commitments and Laws, as well as the documentation required to validate compliance. All monitoring and reporting activities shall be concise, consistent throughout the Term of the Agreement as applicable to the activities being performed, and in accordance with the requirements set forth in the Environmental Laws. The program shall also effectively describe the quality control and assurance measures that the Developer 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. Additional specific requirements are found in Book 2, Section 4. 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 Developer's obligation regarding Governmental Approvals and Laws, including Environmental Laws and Environmental Approvals, and the Developer's obligation for environmental compliance is set forth in Book 2, Section 4.1.

The Developer shall cause Work to comply with Environmental Approvals and compliance requirements for any additional actions throughout the Term of the Agreement. The Developer 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 agency coordination. Changes to the Project schematic or incorporation of Additional Properties into the Project may require new Environmental Approvals.

The Developer will 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 Developer will 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

The Developer, with possible support from TxDOT as indicated in Book 2, shall be responsible for conducting continuing environmental studies based on the Project approved NEPA document and Project schematic.

The Developer, with the possible support from TxDOT as indicated in Book 2, shall be responsible for conducting environmental studies and re-evaluations caused by actions not identified in the Environmental Approvals, actions not covered specifically by existing resource agency coordination, or incorporation of Additional Properties into the Project. The Developer 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 Developer 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 will accept documentation meeting current submission standards. TxDOT will return approved documentation to the Developer for submittal to the appropriate Governmental Entity in cases where the Developer performs coordination. TxDOT, acting reasonably, will 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 Developer, and shall be revised by the Developer to meet standards or requirements.

4.3 Comprehensive Environmental Protection Program (CEPP)

As part of the PMP, the Developer shall develop and implement a Comprehensive Environmental Protection Program, applicable throughout the Term of the Agreement to establish the approach, requirements and procedures to be employed to protect the environment. 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.

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

- Environmental Management System (EMS),
- Environmental Compliance and Mitigation Plan (ECMP),
- Environmental Protection Training Plan (EPTP),
- Hazardous Materials Management Plan (HMMP),
- Communication Plan (CP),
- Construction Monitoring Plan (CMP),
- Recycling Plan (RP).

The dates by which component parts comprising the CEPP are to be submitted for TxDOT approval are set forth in Book 2. 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 be the overarching system by which the Developer 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 Developer shall utilize the EMS to track on-going issues, identify environmental compliances, non-compliances and identify actions required/taken to correct any such non-compliance.

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. For each trigger, the CAP will 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 Developer'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 Developer shall develop and maintain EPIC construction plan sheets. Applicable permits and environmental commitments shall be identified on EPIC sheets and updated throughout the construction period to identify on-Site conditions.

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

The Developer 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 Developer during the life of the Project. The documentation at a minimum shall include:

  - Process for training personnel to recognize Waters of the U.S. that fall under the jurisdiction of the USACE,
  - Process for communicating the terms and conditions of all USACE 404 permits and TCEQ 401 certifications,
  - Procedures for carrying out any required mitigation,
  - 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 Developer by the USACE.

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

The Developer shall document how they will comply with Section 402 of the CWA. The documentation shall include that the Developer 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 Developer is responsible for submitting a Notice of Intent (NOI) to TCEQ. The documentation at a minimum shall include:

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

- 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,
- Procedures for handling non-compliance issues,
- Escalation procedures for SW3P items.

- **State Listed Species and Unregulated Habitat**

The Developer shall develop 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:

- Process for communicating any commitments regarding state listed species and unregulated habitat,
- Procedures for complying with any commitments.

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

The Developer 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:

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

- **Traffic Noise**

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

- Process for carrying out noise mitigation measures as identified and discussed in the approved NEPA document and schematic,
- Process for carrying out noise mitigation measures determined throughout the life of the project,
- Process to handle changes that may occur to proposed permanent noise mitigation in the approved NEPA document and schematic.

To fulfill the commitments of the previously mentioned TxDOT-Provided approvals the Developer 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 Developer. The Developer 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 Developer as the Work progresses.

- **Water Well Impacts and Requirements**

The Developer 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 Developer 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 developer is responsible for any required remediation efforts. The documentation at a minimum shall include:

- Process for training personnel on recognition of wells,
- Procedures for handling wells,
- Procedures for handling contamination of a well that results from the Developer's work. Procedures shall include a requirement to notify TxDOT and with TxDOT's concurrence notify appropriate regulatory agency within 24 hours of the discovery.

- **Cultural Resource Studies**

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

Subsequent to issuance of NTP1, the Developer 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 as defined in the original NEPA Approval and within the area of potential effects. The Developer 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.

The Developer shall document efforts to avoid impacts to cultural resources. that are listed on or eligible for inclusion in the National Register of Historic Places (NRHP), or that are designated as State Archeological Landmarks.

If evidence of a possible historic property is encountered during the course of the Work, the Developer 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, SHPO, FHWA, and ACHP as well as the MOU between TxDOT and the THC. The Developer shall undertake appropriate measures to protect the site from further intrusion to the extent feasible until an appropriate evaluation of the site can be made by a qualified representative. Work shall not be resumed in the area until the Developer receives notification and approval from TxDOT.

- **Public Involvement**

The Developer 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 developer 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:

- Process for handling public involvements requirements,
- Procedures for documenting public involvement.

4.3.3 Environmental Protection Training Plan (EPTP)

The Developer 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:

- Educate every worker to:
  a. Recognize the overall importance of environmental issues to constructing, operating and maintaining a successful Project.
  b. Appreciate the various environmental sensitivities of the Project.
- Train every worker to:
  a. Recognize environmentally sensitive resources that may be encountered during the Work.
  b. Avoid or take appropriate action to minimize environmental impacts from the Work.
  c. Know the required actions, practices, and procedures regarding regulated resources.
- Foster the Developer's management and supervisory personnel's attitude of commitment to the Project's environmental quality.
- Convey to all workers, the Developer's management commitment to the Project's environmental quality.
- Convey to all workers, TxDOT's and the Developer'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:

- Overall importance of environmental protection to the Project
- Compliance responsibility and Governmental Entity authority including background and environmental issues regulatory overview.
- Overview of the Developer's environmental commitments and responsibilities at the Project level.
- Worker responsibilities.
- Wetlands identification.
- Environmental Approvals terms and conditions including an overview of the provisions of the ESA, Migratory Bird Treaty Act, and Stormwater Pollution Prevention Program (SW3P).
- BMPs for environmental compliance, including pollution prevention, erosion, sedimentation, and dust control measures to maintain water and air quality.
- Required mitigation measures.
- Procedures and precautions in the event of spills of or discovery of Hazardous Materials or unknown chemicals or contamination.
- Procedures and precautions in the event human skeletal remains or other archeological or paleontological resources are discovered.
- 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).
- Groundwater protection requirements.
- CWA regulations and surface water protection requirements.
- Overview of noise and residential impact reduction procedures.
- Air quality requirements.
- Penalties and/or fines for violations of and noncompliance with Environmental Approvals and Environmental Laws, including termination of employment.

4.3.4 EPTP Participation

The Developer shall require all employees to participate in the EPTP and shall keep accurate records documenting attendance, as well as materials presented.

4.3.4.1 EPTP Schedule

The Developer 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)

The Developer 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 Developer, encountered or brought onto the Project site by a third party, or otherwise, during the Term of the Agreement. The Developer shall submit the final Hazardous Materials Management Plan to TxDOT for review and approval in its good faith discretion within 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:

- For all chemicals to be used on the Project, the Developer shall keep and update Material Safety Data Sheets (MSDS), per OSHA requirements, for the Term of the Agreement.
- Designated individuals responsible for implementation of the plan,
- Procedures for identifying and documenting potential contaminated sites which might impact Project development,
- Procedures for mitigation of known contaminated sites anticipated to impact construction,
- Procedures for mitigation of unanticipated contaminated sites encountered during construction,
- Procedures for mitigation of contamination during the operation and maintenance of the Project,
- Procedures for developing a detailed Spill Response Plan for the Term of the Project,
- Process for training personnel for responding to and mitigating Incidents involving contamination or waste
- Provisions for appropriate storage and disposal of all waste encountered or disposed of on the Project for the Term.
- Provision for a Hazardous Materials training module as an Element of the EPTP component of the CEPP.
- 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.
- Identification and contact information for designated responsible individuals.

The HMMP shall include provisions for making all on-Site workers aware of 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 the Developer to provide any non-Developer personnel who visit the Project with the appropriate personal protection equipment.

The HMMP shall require that all personnel of Developer-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 the Developer personnel handling Hazardous Materials are current and valid through the duration of the Work.

4.3.6 Communication Plan (CP)

The developer 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 CDA 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.

4.3.8 Recycling Plan

The recycling plan shall document and fully detail the Developer's commitment to recycling, waste minimization and use of "green products" during all aspects of Work. The recycling plan shall document the Developer'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 Developer shall follow the TxDOT specification DMS 11000.

4.4 Environmental Personnel

The Developer, 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), Archeologist, Architectural Historian, Historian, Historical Architect, Natural Resource Biologist, Water Quality Specialist, and Hazardous Materials Manager. All of the ET shall be deemed other principal personnel.

In the CEPP, the Developer shall set forth an approach, procedures and methods for:

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

4.4.1 Environmental Compliance Manager (ECM)

The Developer shall designate a full-time ECM for the Work. The ECM shall report and coordinate all issues directly with TxDOT and the Developer's Project Manager. In the event the ECM, in consultation with the Developer's Project Manager and TxDOT, is unable to reach satisfactory resolution of environmental issues, the ECM shall provide written notification to the Developer 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 environmental compliance for the Work. The ECM shall report immediately to TxDOT and the Developer 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 Developer, 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.

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 Developer's personnel. All training shall be in accordance with the requirements set forth in Section 4.2.3.

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 stoppage of Work.

4.4.4 Cultural Resource Management Personnel

The ECM shall designate an Archeologist, Architectural Historian, Historian, and/or Historical Architect as specified in Book 2, Section 4 to provide expertise in monitoring impacts to cultural resources during the course of the Work.

Qualifications: Cultural Resource Management Personnel shall meet qualifications as specified in Book 2, Section 4.

4.4.5 Natural Resource Biologist

The ECM shall designate a Natural Resource Biologist as specified in Book 2, Section 4 to provide expertise in monitoring impacts on wildlife and the natural environment during the course of the Work.

Qualifications: The Natural Resource Biologist shall meet qualifications as specified in Book 2, Section 4.

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.

Qualifications: The Water Quality Specialist shall meet qualifications as specified in Book 2, Section 4.

4.4.7 Hazardous Materials Manager

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

- Schedule and/or conduct training for the Developer's employees.
- Verify all employee certifications prior to and required for any handling of Hazardous Materials.
- Maintain records of all incidents involving Hazardous Materials and notify the ECM, TxDOT and appropriate authorities in writing of any such incidents.

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

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

5 THIRD PARTY AGREEMENTS

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 Adjusting Utilities 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 Developer's use in Adjusting Utilities. Copies of those forms are included in Attachment -7 (Utility Forms). Except as otherwise provided in this Section 6 or directed by TxDOT, whenever a TxDOT form is provided in the attachment as noted in Book 2, Developer shall prepare all forms of the same type using the TxDOT form.

Developer shall cause all Utility Adjustments necessary to accommodate construction, operation, maintenance and/or use of the Project, in both its initial configuration and in its Ultimate Configuration. TxDOT will assist Developer in the Utility Adjustment process, to the extent described in the CDA 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 Developer 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., Developer-managed). The allocation of responsibility for the Utility Adjustment Work between Developer and the Utility Owners shall be specified in the Utility Agreements.

Developer's obligations regarding reimbursement to Utility Owners for eligible costs of Utility Adjustment Work, and Developer's obligations regarding the accommodation of Utilities from and after the Service Commencement Date, are set forth in Book 2, Section 6.1.

This Section 6 does not address Utility services to the Project. Utility services to the Project shall be the subject of separate agreements between Developer 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.

6.1.2 Certain Components of the Utility Adjustment Work

6.1.2.1 Coordination

Developer shall communicate, cooperate, and coordinate with TxDOT, the Utility Owners and potentially affected third parties, as necessary for performance of the Utility Adjustment Work. Developer shall be responsible for preparing (unless prepared by the Utility Owner) and securing execution (by Developer and the Utility Owner) of all necessary agreements. All such executed Utility Agreements must be approved by TxDOT prior to taking effect.

All executed Utility Agreements between Developer and Utility Owners 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 Developer 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. Developer shall perform all coordination necessary for Betterments.

6.1.2.3 Protection in Place

Developer 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).

6.1.2.4 Abandonment and Removal

Developer 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.

6.1.2.5 Service Lines and Utility Appurtenances

Whenever required to accommodate construction, operation, maintenance and/or use of the Project, Developer shall cause Service Line Adjustments and Utility Appurtenance Adjustments. On completion of these, Developer 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 Developer.

6.1.2.6 Early Adjustments

Early Adjustments, if any, are addressed in Book 2, Section 6..

6.1.3 Reserved

6.1.4 Agreements Between Developer and Utility Owners

Except as otherwise stated in this Section 6 or in the Agreement, each Utility Adjustment shall be specifically addressed in a Master Utility Adjustment Agreement (MUAA) or in a Utility Adjustment Agreement Amendment (UAAA), as described elsewhere in this Section 6. Developer 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.

6.1.4.1 Master Utility Adjustment Agreements (MUAA)

Developer shall enter into one or more MUAAs with each affected Utility Owner to define the design, material, construction, inspection, and acceptance standards and procedures necessary to complete Utility Adjustments, as well as to define Developer'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 MUAA may address more than one Utility Adjustment for the same Utility

Owner. Additional Adjustments may be added to an existing MUAA by a Utility Adjustment Agreement Amendment (UAAA).

Developer shall prepare each MUAA using the standard form of TxDOT Master Utility Adjustment Agreement (Owner-Managed) or TxDOT Master Utility Adjustment Agreement (Developer-Managed), copies of which are in the attachment as noted in Book 2.

Promptly following issuance of NTP1, Developer shall begin negotiations with each affected Utility Owner to reach agreement on one or more MUAAs. Developer shall use good faith efforts to finalize a MUAA with each affected Utility Owner within a reasonable time period after issuance of NTP1. Developer 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 MUAA (including the Utility Adjustment Plans attached thereto) shall be subject to TxDOT review and approval as part of a Utility Assembly.

6.1.4.2 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 MUAA 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 MUAA 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, Developer shall prepare all UAAAs using the standard form included in the attachment as noted in Book 2.

6.1.5 Recordkeeping

Developer 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 CDA 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, these Technical Provisions, the Utility Adjustment Standards applicable pursuant to Book 1, Section 7.5, and the requirements specified in this Section 6.

6.2.2 Communications

6.2.2.1 Communication with Utility Owners: Meetings and Correspondence

Developer is responsible for holding meetings and otherwise communicating with each Utility Owner as necessary to timely accomplish the Utility Adjustments in compliance with the CDA Documents. TxDOT will participate in these meetings if requested by the Utility Owner or Developer, or otherwise as TxDOT deems appropriate.

At least three Business Days in advance of each scheduled meeting, Developer shall provide notice and an agenda for the meeting separately to TxDOT and the appropriate Utility Owner. Developer shall prepare minutes of all meetings with Utility Owners and shall keep copies of all correspondence between Developer and any Utility Owner.

Before distribution of any mass mailings to Utility Owners, Developer shall submit to TxDOT, for its review and comment the form, content, and addressees of any such mass mailings. For purposes of this Section 6.2.2.1, 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.

6.2.3 Utility Adjustment Team

Developer shall provide a Utility Adjustment team with appropriate qualifications and experience for the Utility Adjustment Work. Developer shall provide the names and contact details, titles, job roles, and specific experience of the team members in the PMP. Specifically, Developer shall provide a Utility Manager (UM) and a Utility Design Coordinator (UDC) as described herein.

The UM's primary work responsibility shall be the performance of all Developer's obligations with respect to Utility Adjustments. The Utility Manager shall have a bachelor's degree, and have at least four years of relevant experience in coordinating and solving complex utility adjustments on highway improvement projects. The Utility Manager should be authorized by the Developer 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

Developer 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, Developer 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 its Utility Assembly review. Except as otherwise directed by TxDOT, Developer shall prepare all Affidavits of Property Interest using the standard forms included in the attachment as noted in Book 2.

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. Developer shall have the following responsibilities for each acquisition:

1. Developer 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 Developer-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 Developer shall ensure that the following requirements are met:
   - The files and records must be kept separate and apart from all acquisition files and records for the Project ROW.
   - 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.
   - Any Developer-Related Entity personnel negotiating the acquisition of Replacement Utility Property Interests must be different from those negotiating the acquisition of Project ROW.

Developer is not responsible for Utility Owner condemnation proceedings.

6.2.4.3 Relinquishment of Existing Utility Property Interests

Developer 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, Developer shall prepare a Quitclaim Deed for each relinquishment of an Existing Utility Property Interest using TxDOT's standard form included in the attachment as noted in Book 2. Each Quitclaim Deed shall be subject to TxDOT's review as part of a Utility Assembly as described below.

Developer understands and expects that a Utility Owner will not relinquish any Existing Utility Property Interest until after the Adjusted Utility 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, Developer shall obtain the executed Quitclaim Deed promptly upon completion of the Utility Adjustment.

6.2.4.5 Utility Joint Use Acknowledgements

Developer shall prepare a Utility Joint Use Acknowledgment 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)

Except as otherwise directed by TxDOT in its sole discretion, Developer shall prepare all Utility Joint Use Acknowledgments using TxDOT's standard form included in the attachment as noted in Book 2. Developer also shall prepare all required documentation to be included with each Utility Joint Use Acknowledgment.

Developer 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

Developer 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 0500]*), 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 Developer's Responsibility for Utility Identification

Developer 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.

Developer shall prepare and submit to TxDOT, a Utility Strip Map showing the information obtained and/or confirmed pursuant to this Section 6.3.1. Developer'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.) and the Utility Owner's name and contact information. The scale of the Utility Strip Map shall be as set forth in Book 2. Developer 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 Developer or by the Utility Owner, shall be consistent and compatible with the following:

- The applicable requirements of the CDA Documents, including Section 6.2.1 (Standards)
- The Project as initially designed and constructed as well as the Ultimate Configuration
- Any Utilities remaining in, or being installed in, the same vicinity
- All applicable Governmental Approvals
- Private approvals of any third parties necessary for such work

6.3.3 Utility Adjustment Concept Plans

Developer 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, and Developer's Utility Adjustment recommendations.

In accordance with the PMP, Developer 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. Developer 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.

6.3.4 Utility Adjustment Plans

Utility Adjustment Plans, whether furnished by Developer or by the Utility Owner, shall be signed and sealed by a Registered Professional Engineer (PE).

6.3.4.1 Plans Prepared by Developer

Where Developer and the Utility Owner have agreed that Developer will furnish a Utility Adjustment design, Developer 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 Developer 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. Developer shall transmit any TxDOT comments to the Utility Owner, and shall coordinate any modification, re-approval by the Utility Owner and re-submittal to TxDOT as necessary to obtain TxDOT's approval.

6.3.4.2 Plans Prepared by the Utility Owner

For all Utility Adjustment Plans to be furnished by a Utility Owner, Developer shall coordinate with the Utility Owner as necessary to confirm compliance with the applicable requirements. Those Utility Adjustment Plans shall be attached to the applicable Utility Agreement, which Developer shall include in

the appropriate Utility Assembly for TxDOT's approval. Developer shall transmit any TxDOT comments to the Utility Owner, and shall coordinate any modification, review by Developer 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 Developer 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.

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

6.3.4.5 Utility Assemblies

Each Utility Adjustment (as well as 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 Developer and submitted to TxDOT for its review and comment, and for TxDOT's approval of any items for which this Section 6, including attachments as noted in Book 2, requires TxDOT's approval. 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. Developer 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 MUAA shall be addressed in a single full Utility Assembly, which shall include all items described in the attachments noted in Book 2.

Supplemental Utility Assemblies. For each UAAA, Developer shall prepare a supplement to the Utility Assembly for the relevant initial MUAA (a Supplemental Utility Assembly), covering all Utility Adjustments addressed in the UAAA. The Supplemental Utility 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 Developer (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. Each of the foregoing items shall comply with the requirements for same described in Attachment 8 (Utility Assembly and Tracking Report Requirements).

Abbreviated Utility Assemblies. Developer 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 MUAA or UAAA, or for a group of such Utilities. Each Abbreviated Utility Assembly shall contain a transmittal memo recommending that the subject Utility(ies) remain in place, a completed Utility Assembly Checklist, a certification from the Utility Owner approving leaving the Utility(ies) in place, as well as Utility Joint Use Acknowledgement(s) and Affidavit(s) of Property Interest, if applicable. Each of

the foregoing items shall comply with the requirements for same described in the attachments noted in Book 2.

6.4 Construction

6.4.1 Reserved

6.4.2 General Construction Criteria

All Utility Adjustment construction performed by Developer shall conform to the requirements listed below. In addition, Developer is responsible for verifying that all Utility Adjustment construction performed by each Utility Owner conforms to the requirements described below. In case of nonconformance, Developer 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.

1. All criteria identified in Section 6.3.2 (Technical Criteria and Performance Standards)
2. 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)
3. All Project safety and environmental requirements
4. The ROW acquisition schedule described in Section 7 (ROW)

6.4.3 Inspection of Utility Owner Construction

In the PMP, Developer shall set forth procedures 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).

6.4.4 Scheduling Utility Adjustment Work

The Utility Adjustment Work (other than construction) may begin at any time following issuance of NTP1. Refer to Book 2, Section 6.4.4 for the conditions to commencement of Utility Adjustment Construction Work by Developer. Developer 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:

1. 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);
2. Availability and access to affected Replacement Utility Property Interests have been obtained by the Utility Owner (and provided to Developer, if applicable);
3. If any part of the Construction Work for the Utility Adjustment will affect the Project ROW, the condition set forth in Book 2, Section 6.4.4 has been satisfied.
4. 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.
5. The review and comment process has been completed and required approvals have been obtained for the Utility Assembly covering the Utility Adjustment.
6. 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.
7. All other conditions to that Work stated in the CDA Documents have been satisfied.

6.4.5 Standard of Care Regarding Utilities

Developer 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

Developer shall provide Emergency procedures with respect to Utility Adjustment Work in the PMP. Developer shall obtain Emergency contact information from, and establish Emergency procedures with each Utility Owner.

6.4.7 Utility Adjustment Field Modifications

Developer shall establish a procedure to be followed if a Utility Adjustment Field Modification is proposed by either Developer 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:

1. The Utility Owner's review and approval of a Utility Adjustment Field Modification proposed by Developer, or Developer's review and approval of a Utility Adjustment Field Modification proposed by the Utility Owner;
2. Submittal of plans for the proposed Utility Adjustment Field Modification to TxDOT for its review and comment;
3. Transmittal of Utility Adjustment Field Modifications to the appropriate construction field personnel;
4. Inclusion of any Utility Adjustment Field Modifications in the Record Drawings for the Project.

Developer shall cause the procedure to be followed for all Utility Adjustment Field Modifications, whether the construction is performed by Developer 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, Developer 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

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

Developer shall provide Record Drawings to TxDOT (regardless of whether design and/or construction of the subject Utilities was furnished or performed by Developer 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). Developer shall provide the Record Drawings for each Adjustment to TxDOT not later than 90 Days after the Utility Owner accepts the Adjustment or before such earlier deadline as is specified elsewhere in the CDA 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. Developer 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.

6.4.11 Traffic Control

Developer shall be responsible for, and the Construction Traffic Management Plan shall cover, all traffic control made necessary by for Utility Adjustment Work, whether performed by Developer 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

Developer shall time all Submittals described in this section to meet the Project Schedule, taking into account TxDOT's designated review and response time set forth in Book 2, Section 6.5. All deliverables shall conform to the standards required in the Project Management Plan.

6.5.1 Maximum Number of Submittals

Developer 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, Developer shall not submit more than:

1. Two Utility Assemblies (excluding Supplemental or Abbreviated Utility Assemblies)
2. 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
3. Two Supplemental Utility Assemblies;
4. Two Abbreviated Utility Assemblies.

Where the number of Submittals exceeds these limits, the requirements of Book 2, Section 6.5.1 shall apply.

6.5.2 Developer's Utility Tracking Report

Developer shall maintain a Utility Tracking Report in tabular form, listing all Utilities located within the Project ROW or otherwise potentially affected by the Project. The Utility Tracking Report shall include the items specified in the attachments noted in Book 2.

Developer shall submit the Utility Tracking Report to TxDOT and update it periodically in accordance with the PMP.

6.5.3 Utility Assembly Submittals

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

1. Before submitting a Utility Assembly to TxDOT, Developer 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 Developer in accordance with the PMP; and
   - Resolve all comments made by the quality control/quality assurance entity, coordinating with the Utility Owner as appropriate.
2. Developer shall submit to TxDOT three identical and complete originals of each Utility Assembly (each of which shall be bound and labeled "Developer Copy," "TxDOT Copy," or "Utility Owner Copy," as appropriate), complying with the requirements of Book 2, Section 6.5.3. The "TxDOT Copy" shall be color coded. 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 10 Business Days will return the Utility Assembly to Developer with the appropriate notations (pursuant to Book 2, Section 6.5.3) to reflect its responses. Developer 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 Developer 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, Developer 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 Developer, promptly upon receipt of same from the FHWA.

7 RIGHT OF WAY (ROW)

7.1 General Requirements

Developer's obligations in respect of the acquisition of Project ROW are set forth in Book 1, Section 7.4.

This Section 7 sets forth the ROW activities assigned to Developer, 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 Developer related to the acquisition of Project ROW. Developer 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 Agreement, Developer'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.

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:

- TxDOT *Right of Way Manual* Collection (available online at http://manuals.dot.state.tx.us)
- TxDOT *Access Management Manual* (available online at http://manuals.dot.state.tx.us)
- TxDOT *Survey Manual*
- TxDOT *Appraisal and Review Manual*

Pursuant to the applicable federal regulations, Developer 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.

Developer shall maintain a complete and current set of the TxDOT *Right of Way Manual* Collection, Volumes 1 through 8 (http://manuals.dot.state.tx.us/dynaweb), TxDOT *Access Management Manual* (http://manuals.dot.state.tx.us/dynaweb), 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

Developer shall employ software that is compatible with the software in use by TxDOT, or fully transferable to TxDOT's systems. Developer 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. Developer must maintain and participate in any other required ROW tracking system required by the CDA 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

Developer 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 Developer'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:

1. The name of TxDOT approved title company(ies) to be used for title services
2. The name and qualifications of the proposed ROW Acquisition Manager (ROW AM)
3. The resumes and qualifications for appraisers, appraisal reviewers, land planners, relocation agents, negotiators, real estate attorneys, 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 Developer will:

- 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.
- Provide administrative support.
- Provide for Spanish, visually impaired, or hearing impaired translation, as necessary.
- Provide documentation and reports.
- Produce and distribute acquisition and relocation brochures as approved by TxDOT.
- Establish, implement, and maintain quality control procedures and quality review standards for the acquisition for Project ROW.
- Prevent fraud, waste, and mismanagement.

Developer shall update the ROW Acquisition Plan regularly, at least quarterly, in accordance with the CDA 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 Developer. In developing the Project Schedule, Developer 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, Developer 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, Developer shall assume that the reviews performed by TxDOT will require 10 Business Days for Acquisition Packages that Developer submits as final and complete in accordance with Section 7.3.6 (Project ROW Acquisition Package Approval), up to a maximum of three Acquisition Packages. Any Submittals that would require TxDOT to review more than three Acquisition Packages within any given ten Business Day period shall be considered excess, and TxDOT may defer its review of any such Acquisition Packages to a subsequent ten Business Day period (or periods as necessary). TxDOT will notify Developer of its election to defer any excess Acquisition Packages within ten Business Days after receipt. The balance of Acquisition Packages in excess of three will be rolled over to the next ten Business Day period and added to the Acquisition Package Submittals made by Developer in that period. When Developer opts to submit more than one Acquisition Package at any given time, Developer shall indicate the priority of required review in order to meet the Project Schedule.

If TxDOT notifies Developer that any submitted Acquisition Package has a deficiency, Developer 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 Developer and will not be eligible for treatment as a Relief Event or Compensation Event.

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 Developer in writing that the review period will be extended by an additional ten Business Days before rendering a decision to Developer.

Developer 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 Developer of any deficiencies within ten Business Days after TxDOT's receipt of such preliminary submission.

7.2.5 Developer's Project ROW Scope of Services

Developer shall complete all administrative activities and prepare all documentation sufficient for Developer to acquire the Project ROW. Developer 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 Developer in accordance with Section 7.2.4 (Schedule and Review Procedures), or (iii) in the case of an Acquisition Package that is deficient, notify Developer of the deficiency(ies) to be corrected by Developer 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, Developer 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, Developer 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 Developer and the landowner cannot negotiate an agreed-upon purchase price, acceptable to TxDOT, TxDOT will commence acquisition of the property through eminent domain procedures. Developer 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.

Developer 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

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

- Project ROW surveying and mapping
- Project ROW budget estimates and updates
- Title services

- Appraisal services
- Appraisal review
- Negotiations
- Closing services
- Relocation assistance
- Condemnation support services
- Clearance and demolition of Project ROW
- Environnemental due diligence
- Documentation and document control
- Progress reports
- Project ROW administration and management
- Project ROW quality management
- Letter from Developer's design engineer certifying that the required Project ROW acquisition is necessary and that any proposed alternatives are not feasible or are cost prohibitive
- Obtaining rights of entry, as necessary

7.2.7 ROW Personnel Qualifications

Developer's ROW Acquisition Manager shall have at least five years experience managing the acquisition of transportation ROW projects for a condemning authority, be licensed as a real estate salesman or broker pursuant to the Texas Real Estate 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.

Each appraiser and appraisal reviewers shall be licensed and certified in the State of Texas and shall have a minimum of five years experience in appraising real property for eminent domain purposes, including partial taking appraisal, partial taking appraisal review and expert witness testimony. He or she must also have been actively and continuously engaged for at least three years immediately preceding his or her selection for this Project in appraisal work primarily in the County(ies) defined in Book 2, 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.

Each land planner shall have a minimum of five years experience in land planning, including experience with expert witness testimony in eminent domain proceedings. He or she must also have been actively and continuously engaged for at least three years immediately preceding his or her selection for this Project in land planning work primarily in the County(ies) defined in Book 2, or as approved by TxDOT. Developer shall provide a minimum of two land planners available to assist appraisers and complete land plans.

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

Each ROW negotiator shall be licensed either as a real estate sales person or broker pursuant to the Texas Real Estate 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 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.

Each real estate attorney shall be licensed by the State of Texas and shall have at least five years experience in title review and curative matters. The following responsibilities can be handled by either the real estate attorney or qualified ROW personnel: coordinate and clear 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 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 Developer Conflict of Interest

If at any time, Developer or to the best of Developer's knowledge, any Developer-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, Developer shall promptly disclose the same to TxDOT. In the case of acquisitions, loans or mortgage purchases that occurred prior to the execution of the Agreement, such disclosure shall be made within ten days after execution of the Agreement.

In the event that Developer, or any subsidiary or parent company of Developer, 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.

Developer shall not acquire or permit the acquisition by Developer or any Developer-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

Developer shall attend meetings as requested by TxDOT. At such meetings Developer 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. Provide exhibits as requested by TxDOT.

7.2.10 Documentation and Reporting

Developer 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):

- County
- Control Section Job (CSJ) number
- Highway Designation
- Project limits
- Parcel number
- Name of record owner(s)

In administering and managing its Project ROW activities, Developer shall:

1. Maintain parcel records on file of all aspects of the acquisition process in accordance with TxDOT requirements and applicable Law. Each parcel file shall include all documents required by the CDA Documents, the FHWA, and/or TxDOT.
2. Provide monthly summaries for the cost of Project ROW acquisition and related relocation assistance including amounts authorized and amounts paid on a parcel-by-parcel basis and budget forecasting on an overall Project basis as requested by TxDOT.
3. Maintain and electronically transmit to TxDOT, in a format acceptable to TxDOT, monthly status reports including appraisal, acquisition 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.
4. Evaluate and report to TxDOT, Subcontractor status and performance on a monthly basis or more frequently as requested.
5. Prepare and submit electronically to TxDOT, on a monthly basis, a spreadsheet that contains Project ROW specific data required in order to complete the fields in TxDOT's ROWIS tracking software program or as directed by TxDOT.
6. Input and update parcel status in TxDOT approved Web-based tracking system or as directed by TxDOT.

7.2.11 Responsibilities of Developer

As set forth in Book 1, Section 7.4.3 and as more fully described in this section, Developer 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 Developer 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.

Developer and TxDOT acknowledge that Developer has incorporated the value of saleable improvements not retained by the property owner into the Project ROW costs shown in the Financial Model, and that Developer, subject to the property owner's waiver of the rights to retain, 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. Developer 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, Developer shall comply with all applicable Laws with respect to relocation assistance and demolition.

Developer 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 Developer deems advisable to acquire for work space, contractor lay-down areas, material storage areas, borrow sites, or any other convenience of Developer. 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 Developer'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.

Developer 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.

Developer 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:

1. 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 CDA Documents, by the State, or by applicable Law within 10 Business Days after receipt of complete Acquisition Packages from Developer.
2. After receiving a complete condemnation packet from Developer 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.
3. TxDOT shall endeavor to reasonably accommodate a written request from Developer for early submission to the agenda of the Texas Transportation Commission in accordance with Section 7.2.12 of Book 2.
4. TxDOT will coordinate with the Office of the Attorney General to provide legal counsel to prepare and deliver to TxDOT the condemnation petition within 20 Business Days after the Attorney General's receipt of the condemnation packet, including Commission minute order approval. TxDOT will deliver the condemnation petition to Developer within ten Business Days after receipt of the condemnation petition from the Office of the Attorney General.
5. TxDOT will provide all coordination services between Developer and the Office of the Attorney General for prosecution of jury trials.
6. 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 Developer. TxDOT may contract with independent consultants to assist it in fulfilling the audit/monitoring function provided that the audit authority is not delegated. The foregoing does not limit the authority of the Independent Engineer to audit the Project ROW activities and services of Developer.

In addition to any of the matters specifically required to be provided by Developer to TxDOT pursuant to the foregoing sections, Developer shall provide information to TxDOT as requested to assist in its review and assessment of the progress, timeliness, adequacy, or sufficiency of Developer'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 Developer 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:

1. Preparation of complete petitions for condemnation with the appropriate court for a cause number to be assigned
2. Coordination with TxDOT on all legal matters concerning acquisition processes, including negotiated settlements
3. Analysis of recommended parcel values and/or appraisal issues
4. Additional legal advice and opinions as needed by TxDOT
5. Special commissioners' hearings
6. Jury trials including determination of expert witnesses and all appeals
7. 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

Developer 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 Manual*. Developer shall refer to the current *Manual of Practice* by the Texas Society of Professional Land Surveyors and the *US National Map and Accuracy Standards*. Developer shall refer to Section 9 (Land Surveying) for additional survey requirements.

The Project ROW map shall be prepared by Developer 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 15 Business Days for review of each submitted ROW map, up to a maximum of 25 parcels. Any submittals that would require TxDOT to review more than 25 parcels in a ROW map within any given 15 Business Day period shall be considered excess, and TxDOT may defer its review of any such excess parcels to a subsequent 15 Business Day period (or periods as necessary).

Developer 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:

1. Three half size right of way maps on paper, Scale 1"= 100' (11"X 17").
2. One separate set of Originals signed and sealed by RPLS, legal and sketchy, traverse closure sheet and a copy of the parent track deed.
3. Create CD with DGN Master File, Map Sheets, Excel Point List and Raw Data File and/or Field Notes.

Developer shall submit the Acquisition Packages in conformance with Section 7.3.6 (Project ROW Acquisition Package Approval).

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

1. Developer 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.
2. 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.*

3. The point of beginning (POB) shall be located on the proposed Project ROW line and shown in all documents with its centerline (Survey Baseline) station and offset.
4. 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.
5. The centerline (survey baseline) station and offset shall be shown on the Project ROW map sheets for all significant points along the Project ROW line such as point of curvature (PC), point of tangency (PT), point of intersection (PI), point of compound curvature (PCC), and point of reverse curvature (PRC), and for property line intersections (PLI) with the Project ROW line, and for any other monumentation points on the Project ROW line.
6. The centerline (survey baseline) station and offset shall be shown in the parcel description and parcel plat at the beginning and ending, being the points with the lowest station and the highest station, of each parcel along the proposed Project ROW line.
7. Project ROW map sheets shall include all curve data, with the station and coordinates of the PI, and the stations at each end (PC, PT, PRC, PCC), for every centerline (survey baseline) curve on that map sheet.
8. Any existing ROW lines being incorporated into the proposed Project ROW, including intersecting rights of way, shall be surveyed and monumented (if not previously monumented).
9. All Project ROW maps (and on the title sheet) and all parcel descriptions (at the end of the description) shall include a notation that identifies the State Plane Coordinate System and UTM zones, datum (NAD83) (HARN) (2002), and the Project grid-to-surface coordinate adjustment factor or refer to PrimaryPproject Controls provided by TxDOT (refer to Section 9.2.3.1 and 9.2.3.2).
10. A Project ROW map title sheet with signature blocks shall be produced for each portion of the Project. Developer shall sign the Project ROW map.
11. 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.
12. The parcel description and parcel plat documents shall all be referenced as parts of the exhibit recorded with the deed, so the pages shall be numbered accordingly. For example, if the parcel description is two pages, the parcel plat is one page, then the first page of the parcel description is denoted "Page 1 of 3", the parcel plat is denoted "Page 3 of 3".
13. Improvements within 100 feet outside of all proposed Project ROW shall be depicted on the Project ROW map sheets. All improvements should be current as of the date of the on-the-ground property survey.
14. 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.
15. Calculated points shall be shown by a symbol on the drawing, with their relationship to the found reference points.
16. All property, city, county, abstract, section, and survey lines shall be indicated appropriately. A map legend should clearly define the line styles and symbols used.
17. Upon final submittal of the Project ROW documents to TxDOT, Developer 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).
18. Prior to acceptance of the ROW maps and surveys by TxDOT, Developer shall cause a TxDOT Type II monument to be set at all significant points on the Project ROW line and at intersections

with existing Project ROW lines, replacing monuments as described above (construct according to TxDOT specifications), unless otherwise directed by TxDOT.

19. Developer 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 monument 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), Developer shall set a rod-and-cap monument; and upon completion of the Project ROW acquisition or as directed by TxDOT, Developer 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.
20. For any required revisions, Developer shall resubmit to TxDOT all documents pertaining to the parcel to reflect the most recent revision date, and shall add a notation on the appropriate documents to state briefly the reason for the revision.
21. Documents shall contain deed references (survey name, abstract number, volume and page or document number, grantee, and area) for all existing public right of way encountered within the Project limits. If there is no recorded information found, a note shall state "Based upon our research, there appears to be no recorded vesting deed for the public right of way as shown hereon".
22. The documents produced by the surveyor are the property of TxDOT, and release of any document shall be subject to TxDOT's prior written approval.
23. Developer 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. Developer 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..
24. The Project ROW map and each parcel plat shall include a parcel information table containing the areas, expressed in square feet, of the following: 1) the parent ownership as stated in all adjoining record vesting deeds or converted from the stated record acreage in those vesting deeds; 2) the parcel to be acquired as shown on the closure report for that parcel, and; 3) the remainder tract (item 1 minus item 2). If the parcel to be acquired consists of multiple parts, the Project ROW map shall show the net remainder. The parcel information table shall also contain the areas, expressed in acres, of the parent tract, the parcel to be acquired, and the remainder. This acreage (except stated record) shall be converted from the square footage as contained in the table. A note shall be included on the Project ROW map and on each parcel plat stating: "The acreage calculated and shown hereon is converted from the square footage shown hereon, and is for informational purposes only." Parcels with area less than one acre will not require acreage units to also be shown.
25. Within the proposed Project ROW, all property owned by a city, county, or other local public agency (LPA) in fee or easement that does not have a vesting deed shall be identified by a parcel number and included on the Project ROW map. Developer shall cause the surveyor to prepare a parcel description and parcel plat for use as an exhibit in the Project ROW acquisition (property transfer) documents.
26. Developer 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 Developer, 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).

27. Parcel numbering shall follow the TxDOT *ROW Manual*. Parcels are to be numbered based upon the parent tract. Developer 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. Developer shall not use the letter "E" to avoid confusion with easement designations. Parcel numbering shall be sensitive to the appraisal of the required parcels.
28. Complicated portions of a Project ROW acquisition survey can cause the Project ROW Map to be very difficult to read. TxDOT's preferred solution is to create an additional Project ROW map sheet or sheets for details, curve data, general notes, etc. The primary page would still retain the whole property inset, record ownership data, and most of the usual information. The additional sheet(s) 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. Developer shall use the preferred solution unless TxDOT approves an alternate method.
29. An ownership sheet or sheets, containing an index to the information for all the parcels, shall be included and located near the beginning of the Project ROW map, after the title sheet and control sheet. The ownership sheet index shall include the parcel numbers, the names of the property owners, the vesting deed recording information, the record area of the parent tract, the area of parcel(s) to be acquired, the area of the remainder(s) left and right, the beginning and ending stations of the parcel along the Project ROW line, and the sheet number in the Project ROW map where the parcel is located.
30. At property corners where more than one monument is found, a detail shall be provided to show the measured relationship between the monuments found and the monument set or held.
31. Developer shall purchase all materials, supplies and all items necessary for proper survey monumentation. Developer may purchase Type II monuments from TxDOT. TxDOT shall make available for pick-up by Developer Type II monuments within 75 days after TxDOT receives from Developer 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 Developer a written invoice. Developer may use these monuments only for this Project and shall be responsible for proper storage thereof.
32. Developer at the request of the property owner or TxDOT shall re-stake the proposed ROW.

7.3.2 Additional Reporting Requirements

In addition to the Project ROW map, parcel description, and parcel plats, Developer shall provide the following reports and electronic files:

- Monthly Parcel Report: Developer shall provide a report, prior to the first of the month, listing all parcel deletions, parcel additions, and parcel splits.
- Monthly Progress Report: Developer shall provide a report of all survey activity that occurred over the previous month, including a two-week look ahead of anticipated survey activity.
- CAD Files: Developer 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. Developer 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, Developer shall comply with the applicable standards identified in Section 7.2.1, including the following requirements:

1. 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 180 Days prior to the date of submittal to TxDOT of the Acquisition Package for such parcel. Developer shall, at its own cost, review each title report to ensure that it complies with the format required by the CDA Documents. Developer 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. Developer 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.
2. 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.
3. 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.
4. 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. Developer 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

Developer 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 Developer'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.

7.3.5 Appraisals

7.3.5.1 Appraisal Services

Developer 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. Developer 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 Developer. Developer 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.
3. If necessary, make a diligent effort to secure a written agreement between the record title owner and Developer granting TxDOT, Developer or assignees permission to enter the applicable parcel to be acquired (a "Right of Entry Agreement"). Developer may at its sole discretion and expense offer to pay reasonable compensation for any required Right of Entry Agreements. If Developer, after best efforts, is unable to secure a Right of Entry Agreement from the property owner, Developer 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. Developer 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, 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 shall be performed for all properties. If it is determined that there is a potential environmental risk based on the Phase I 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. Developer 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 Developer.
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. Developer 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, Developer 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 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 *Appraisal & Review Manual*, the Uniform 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 (Tabulations of Value) 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 *Appraisal and Review Manual*. A new TxDOT Form ROW-A-10 - Tabulations of Value will be required for each updated appraisal ordered by Developer.

7.3.6 Project ROW Acquisition Package Approval

Acquisition Packages submitted by Developer 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 180 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 Developer's analysis of each preliminary title report or title commitment to determine potential problems and proposed methods to cure title deficiencies. Developer shall perform title curative Work. Developer shall provide TxDOT with copies of all curative documents.
5. A copy of the appraisal report 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 Developer as required or requested by TxDOT, on Developer'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, Developer may proceed with the offer to the property owner.

7.4 Acquisition Activities

7.4.1 ROW Negotiations

Developer shall conduct all negotiations in accordance with the requirements of applicable Law. In conjunction with negotiations, Developer shall:

Within ten Business Days of TxDOT's approval of the Acquisition Package, contact each property owner or owner's designated representative, in person where practical, to present the offer and deliver an appraisal report (not more than 6 months old) and appropriate brochures. 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. Developer shall also maintain a file record of receipt of appraisal signed by the property owner. Developer shall also maintain follow-up contacts and secure the necessary documentation and title curative Work upon acceptance of the purchase offer.

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 Developer and shall include language about the use of the Declaration of Taking Procedure if Developer anticipates requesting the utilization of this procedure by TxDOT anywhere within the Project.

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.

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 Developer in accordance with standards, manuals and procedures as defined in Section 7.2. Developer and TxDOT shall jointly determine whether to accept a settlement request. Delivery of

the administrative settlement request and Developer's recommendation to TxDOT must occur within five Business Days of Developer's receipt of the administrative settlement request.

Developer, 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.

Developer 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. Developer 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, Developer shall mail (return receipt requested) response letters not more than three Business Days following any decision by the TxDOT Administrative Settlement Committee. If Developer selects the mailing option, Developer 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.

Notwithstanding an unsuccessful completion of the formal administrative settlement process, Developer may, in its sole discretion, engage in ongoing negotiations with the owners of compensable interests. Developer 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. Developer shall submit to TxDOT its recommendation of a negotiated settlement and obtain TxDOT's consent prior to acceptance of any settlement.

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.

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.

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 ROW documents must be retained and properly secured in Developer's Project office or as otherwise approved by TxDOT. Signed original documents shall be periodically forwarded to 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.

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.

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 Developer strictly in accordance with the Law and only with the prior written consent of TxDOT. If Developer exercises the use of a TxDOT PUA, Developer 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.

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. Developer acknowledges and understands that TxDOT encourages all

positive and creative solutions which satisfy the property owner and promote the success of the Project.

Developer shall prepare and deliver a final offer letter to the property owners, lessees, licensees, occupants, or other holders of any compensable interest, as applicable. The letter shall be on Developer's letterhead and shall be signed by the ROW Acquisition Manager. Developer 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, Developer shall follow the procedures established for condemnation.

7.4.2 Relocation Assistance

Developer shall coordinate and perform the administrative requirements necessary to relocate any occupants from Project ROW. All Work prepared by Developer with respect to relocation assistance shall be performed in accordance with applicable Law, including the Uniform Act and TxDOT standards, and in accordance with all provisions of this Agreement.

Developer shall maintain a relocation office (meeting ADA requirements) within reasonable proximity of the Project area as approved by TxDOT. At a minimum, the office hours of the relocation office shall be posted to meet the following timetables:

- Monday thru Friday: 8:00 am to 5:00 pm
- Saturday: 9:00 am to 12:00 pm
- Sunday: office shall be closed

In addition to the office hours listed above, Developer shall be available to all displacees for relocation services at the convenience of the displacees.

Developer'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.

Developer shall provide relocation assistance strictly in accordance with the Law, and, in particular, the Uniform Act and TxDOT standards. With respect to relocation assistance, Developer 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. Developer shall perform relocation interviews, complete and maintain interview forms and discuss general eligibility requirements, programs, and services with potential displaces. Developer 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-R-116 - Replacement Housing Inspection.
8. Request at least three moving estimates from moving companies to effect relocation of personal property.
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-R-96-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 Developer's designated relocation letterhead and have Developer'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 Sheriffs Department when the local authorities are carrying out eviction.

7.4.3 Closing Services

For purposes of closing services, Developer shall:

1. 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.

2. 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.
3. Coordinate with TxDOT and the applicable title company to obtain an updated title commitment within 24 hours prior to closing and then obtain an issued title policy based on the approved updated title commitment within 30 Days following closing and transmit the same to TxDOT.
4. 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

Developer 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 *Appraisal and Review Manual*, Chapter 6 "Eminent Domain-State Acquisition" or as revised; and in Chapter 21, Texas Property Code.
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-E-49 – 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), final offer letter reflecting latest appraisal, complete minute order request form (form to be provided by TxDOT), any correspondence sent by Developer or from the owner of the compensable interest or representatives, one copy of the appraisal report not more than 90 Days old, and proof of good faith negotiations. Submit two complete condemnation packets to TxDOT's ROW Administrator.
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.
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. Developer 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. Developer, 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 Developer 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" at least 11 Days prior to 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-E-73 – Data Sheet – Special Commissioners Hearing and commissioners' time sheets. Developer 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. Developer 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, Developer 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 Developer shall appear as expert witness or fact witness, as requested. Developer 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. All documents and exhibits used in the special commissioner's hearings shall be submitted to TxDOT within 20 Days after completion of such hearing.
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.

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, Developer, at its cost, shall order transcripts of such hearing.

7.4.5 Clearance/Demolition of Project ROW

Prior to demolition of any improvements, Developer 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. Developer shall also have photos of personalty 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, Developer shall:

1. Secure and protect the buildings, improvements and fixtures on the Project ROW until they are disposed of or demolished. Developer 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 (Developer 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, Developer 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 Developer-provided fencing shall conform to the overall aesthetics requirements found elsewhere in these CDA 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), Developer shall, at a minimum, construct a 6-foot-high chain-link fence with metal posts. Developer 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

Developer 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, Developer 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."

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

After NTP, Developer 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 Developer to complete the acquisition of certain parcels.

8 GEOTECHNICAL

8.1 General Requirements

Developer shall perform all geotechnical investigations, testing, research, and analyses necessary to effectively determine and understand the existing surface and subsurface geotechnical conditions of the Project ROW to be used by Developer to carry out the Work. Developer 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 CDA requirements.

8.2 Design Requirements

8.2.1 Subsurface Geotechnical Investigation by Developer

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

If environmentally-sensitive conditions are encountered during the subsurface exploration activities, Developer shall undertake appropriate actions in accordance with Section 4 (Environmental).

Developer shall prepare, implement, maintain, and amend, as needed, Geotechnical Engineering Reports documenting the assumptions, conditions, and results of the geotechnical investigation and analysis, including the following:

- The geology of the Project area, including soil and/or rock types
- Field investigations and laboratory test results used to characterize conditions, including moisture content, plasticity index, gradations for each major soil strata change, levels of shrink/swell potential, and levels of sulfate (on-site and borrow)
- A discussion of conditions and results with reference to specific locations on the Project
- Design and construction parameters resulting from the geotechnical investigation and analysis, including parameters for the design of pavements, pipes, structures, slopes, and embankments
- Plan view locations of field sampling, boring logs and other field data, laboratory test results, calculations, and analyses that support design decisions

8.2.2 Pavement Design

Developer shall design, construct, and, where applicable, maintain roadway pavements using Good Industry Practice and the subsurface geotechnical data collected by Developer. The pavement designs shall be signed and sealed by a Professional Engineer Registered in the State of Texas. Developer shall include the proposed pavement designs for the Project in the Proposal and shall indicate the applicable roadway and station limits for each pavement design. Where applicable, the Proposal shall also include a detailed description of the proposed pavement maintenance program for the duration of the Maintenance Agreement. The Developer shall provide in the Proposal a tabulation of the design k-values, resilient modulus, or other basis for the pavement thickness designs, and including station limits. After Developer has completed its pavement investigations and analyses, Developer shall provide verification of the Proposal pavement designs for TxDOT review.

The TxDOT *Pavement Design Manual* 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 Book 2. 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

Developer should expect that subgrade materials will vary throughout the Project limits. Developer 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 lower value than used for the Proposal-phase pavement designs, Developer shall submit an adjusted pavement design for review and acceptance by TxDOT. The Developer assumes all responsibility for increased pavement construction costs resulting from changes to the proposal pavement design increased pavement thickness designs.

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

- Mainline and ramp pavements
- Mainline and Ramp Toll Plazas including the entrance and exit transitions
- Frontage road pavements
- Cross-road pavements
- Service driveways and parking areas
- Temporary pavement construction areas

Pavement design report(s) shall document the assumptions, considerations, and decisions contributing to Developer's pavement designs, including the following:

- Pavement design details by location, including structural layer materials, general specifications, and thicknesses
- Where applicable, lifecycle management analysis, including the periods for resurfacing, reconstruction, and other rehabilitation measures and what these activities are likely to entail
- Relevant pavement evaluation data (structural and functional) and condition information on adjacent roads
- Site conditions which might influence the design and performance of pavements
- Relevant geotechnical data and drainage requirements including boring logs, laboratory soil test results, and active or passive drainage system design
- Design criteria used in determining the pavement design(s), including traffic loads, pavement material characterization, environmental conditions, and pavement design life

- Other considerations used in developing the pavement design(s), including subgrade preparations and stabilization procedures

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 Developer and the Owner understand that new methods, procedures, and products may present opportunities for improved pavement design and management during the time frame of this Contract. Both parties mutually agree to consider the use of new design technologies provided that any such technologies and methods are agreed to by the Developer and approved by the Owner 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 Book 2. 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 the Owner.

8.2.2.3 Pavement Type Selection

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

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

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

Toll Plaza. Toll Plaza lanes may be exempted from required use of CRCP. The Developer shall coordinate with the Owner for special reinforcing or pavement design, within Toll Plaza areas. Concrete Pavement Contraction Design (CPCD) shall be selected when Glass Fiber Reinforced Polymer Bars are used. Final design details used on the Project shall be submitted to the Owner for acceptance.

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

Facility Access Parking. Facility access parking areas shall be Concrete Pavement Contraction Design (CPCD) with a minimum concrete thickness of eight (8) inches unless otherwise specified by the Owner.

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)	Provided in Book 2
* Table 8-1, *TxDOT Pavement Design Guide, Revised October 2006* ** Table 8-2, *TxDOT Pavement Design Guide, Revised October 2006*	

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). Developer shall design the overall subgrade and pavement structure to have a PVR no greater than 1.0 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, 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 mainline pavements, and to a depth of 7 feet from finished pavement surface for non-mainline 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 Developer shall use the TxDOT online *Pavement Design Guide.* The pavement designs shall utilize either the TxDOT FPS-19W 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 will be based on the following:

- *Mainline and Ramps.* A design life of 30 years shall be used with an initial performance period of at least 15 years.
- *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. Developer shall design the overall subgrade and pavement structure to have a PVR no greater than 1.0 inch for mainline and 1.5 inches for non-mainline pavements as calculated in accordance with Tex-124-E from soil tests in a soil column 15 feet deep as measured from the proposed finished pavement. Alternatively, provide materials that result in an Effective Plasticity Index of less than 25 when calculated to a depth of 8 feet from finished pavement surface for mainline and to a depth of 7 feet from finished pavement surface for non-mainline pavements. Calculation and sampling requirements for determination of Effective PI are stated in Section 8.3.1 *Pavement Material Requirements.*

Design Modulus. The Developer 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-19W 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 the Owner to use alternative methods for determining material moduli proposed by the Developer, justification and documentation shall be provided to demonstrate that an equivalent pavement structure will be provided.

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

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

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

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

Table3. 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.

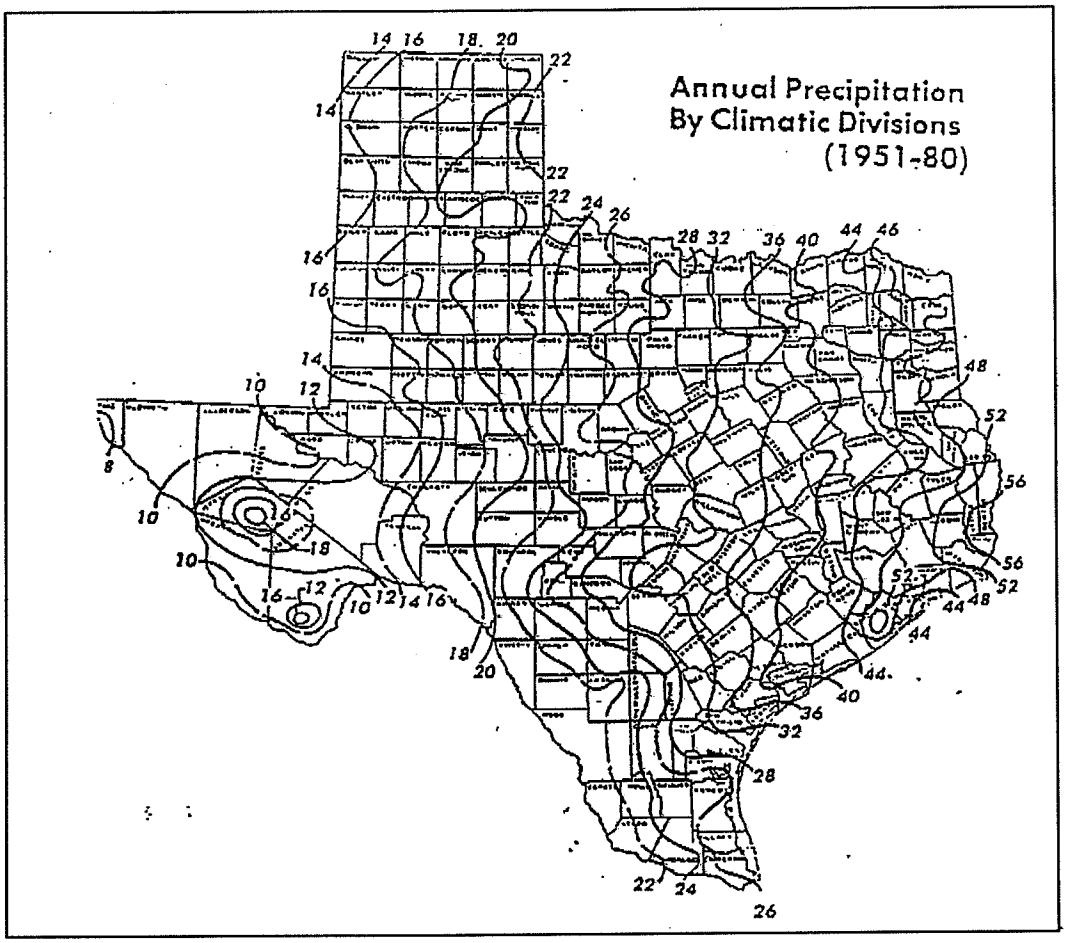

Figure 1. Rainfall graph for determining regional soil testing requirements

(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 the following structural values for design:

Table 4. Design Structural Values

Material Type	2004 Specification	Maximum Modulus for FPS-19	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

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 Book 2.

Initial ADT and 20yr projected ADT. The Initial ADT is the projected ADT when the Project is opened for public access and will be provided in Book 2. The ADT projected to occur 20 years after the Project is opened to public access will also be provided in Book 2.

Initial Serviceability Index. The initial serviceability index for Mainline 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 (mainline and frontage roads).

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

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

8.3 Construction Requirements

8.3.1 Pavement Materials Requirements

The Developer 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 Owner, alternate material specifications and construction requirements may be proposed by the Developer provided the objectives of the project are met and an equivalent pavement structure is provided.

Subgrade Material Composition. The Developer 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, Developer shall submit alternate designs and/or construction procedures for Owner approval.

When quantities of soluble sulfates detected are greater than 500 ppm, the Developer 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. The TxDOT "Guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures" shall be used to assist with testing and detection. For the extent of soil containing greater than 3000 ppm soluble sulfate minerals, a minimum of 8 inches of sulfate-free fill material shall separate the bottom pavement layer assigned structural credit and the sulfate bearing soil. 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. Developer 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; i.e. 8 feet for mainline pavements and 7 feet for non-mainline pavements. 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. Where one or more unbound layers of granular base are placed, a Grade 1 base as defined by Item 247 of the TxDOT *Standard Specifications* is required. 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 or Grade 2 base as defined by Item 247 of the TxDOT *Standard Specifications*, 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 developer 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 four (4) inches of asphaltic concrete pavement.

Asphalt Binders and Mix Selection. Where flexible pavement structures are selected, the final surface mix for mainline lanes and ramps shall be Stone Matrix Asphalt (SMA) meeting the requirements of Item 346 or a Permeable Friction Course (PFC) meeting the requirements of Item 342. The final surface mix for frontage roads and cross roads shall be Stone Matrix Asphalt (SMA) meeting the requirements of Item 346 when the combined HMA thickness is greater than 6.0 inches, or a regular dense-graded mix Type C or Type D meeting the requirements of Item 341 when the combined HMA thickness used is less than 6.0 inches.

8.3.2 Construction Verification

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

Effective Modulus of Subgrade Reaction. The Developer 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 Developer shall submit this verification plan to the Owner for review and comment.

Effective Resilient Modulus, (MR). The Developer 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 mainline 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, Developer shall be responsible to take corrective action that is acceptable to the Owner.

Effective Plasticity Index (PI). The Developer shall demonstrate to the Owner 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. Mainline 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 Developer 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, Developer shall be responsible to take corrective action that is acceptable to the Owner

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:

The Owner will evaluate profiles based on the CQAF test results to determine acceptance and corrective action. Corrective action acceptable to the Owner is required, at the Developer'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, reprofile the pavement section to verify that corrections have produced the required improvements.

Use diamond grinding or other methods approved by the Owner 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.

8.4 Deliverables

The following Deliverables shall be submitted to TxDOT for their review:

a) Geotechnical Engineering Reports including any later supplements or amendments

b) Pavement Design Reports including any later supplements or amendments

c) Verification of Proposal phase pavement thickness designs

d) Traffic Control Plans associated with subsurface geotechnical or pavement investigations

e) A list of all geotechnical and pavement design software proposed for use

f) Verification plan for effective modulus of subgrade reaction

9 LAND SURVEYING

9.1 General Requirements

Developer shall provide accurate and consistent land surveying and mapping necessary to support ROW acquisition, design, and construction of the Project.

Developer shall review existing survey data and determine the requirements for updating or extending the existing survey and mapping data. Developer is responsible for the final precision, accuracy, and comprehensiveness of all survey and mapping.

9.2 Administrative Requirements

9.2.1 Standards

Developer shall ensure that all surveying conforms to the *General Rules of Procedures and Practices* of the Texas Board of Professional Land Surveying. Developer 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

Developer shall secure written permission prior to entering any private property outside the ROW. It shall be Developers' sole responsibility to negotiate this permission and Developer 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 Developer.

9.3 Design Requirements

9.3.1 Units

All survey Work shall be performed in the U.S customary units system of measurement.

9.3.2 Survey Control Requirements

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

Developer shall establish and maintain additional survey control as needed and final ROW monumentation throughout the duration of the Project. Developer shall replace all existing survey monuments and control points disturbed or destroyed.

Developer 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 Developer chooses to use GPS methods, Developer shall meet the accuracy of the appropriate level of survey as defined in the TxDOT *GPS User's Manual.*

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

9.3.3 Conventional Method (Horizontal & Vertical)

If Developer chooses to use conventional methods to establish additional horizontal control, Developer 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

Developer 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, Developer 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

Developer may use an electronic field book to collect and store raw data. Developer shall preserve original raw data and document any changes or corrections made to field data, such as station name, height of instrument, or target. Developer 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.) Developer shall deliver copies of any or all field notebooks to TxDOT upon request.

9.4 Construction Requirements

9.4.1 Units

Comply with Design Requirements.

9.4.2 Construction Surveys

Comply with Design Requirements.

9.5 Deliverables

9.5.1 Survey Records

Developer 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 Developer within 90 days of Service Commencement.

All topographic mapping shall be provided electronically to TxDOT in its native digital terrain model format.

9.5.2 Final ROW Surveying and Mapping

Developer 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.

9.5.3 ROW Monuments

Upon final submittal of the ROW documents to TxDOT, Developer 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:

- Points of curvature (PCs)
- Points of tangency (PTs)
- Points of intersection (PIs)
- Points of compound curvature (PCCs)

- Points of reverse curvature (PRCs)
- 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)
- 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, Developer 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). Developer 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).

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

10 GRADING

10.1 General

Developer shall conduct all work necessary to meet the requirements of grading, including ROW preparation, embankment, subgrade preparation and stabilization, slopes, topsoil, and sodding in accordance with the requirements of this Section 10.

10.2 ROW Preparation

Developer 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 feet below the final finished grade or one (1) foot below the pavement stabilized subgrade, drainage structures,. Developer shall ensure that abandoned structures are structurally sound after abandonment.

TxDOT reserves the right to require Developer, 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 Developer to salvage and deliver to a reasonable location designated by TxDOT any ITS equipment and materials in an undamaged condition.

The material from structures designated for demolition shall be Developer's property. All material removed shall be properly disposed of by Developer outside the limits of the Project.

10.3 Slopes and Topsoil

Developer shall exercise Good Industry Practice regarding design limitations and roadside safety guidelines associated with the design of slopes along roadways. Developer shall adjust grading to avoid and minimize disturbance to the identified waters of the U.S.

Developer shall perform finished grading and place topsoil to a 4-inch compacted depth in all areas suitable for vegetative slope stabilization (and areas outside the limits of grading that are disturbed in the course of the Work) that are not paved or part of a rock outcropping feature.

10.4 Sodding

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

10.5 Deliverables

Not used.

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.

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

11.2 Design Requirements

Developer 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.

Developer 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.

The Design Hour Volumes (DHV) for the Design Year are summarized in Book 2, Section 11. Developer shall complete the design of the Project roadways in a manner that meets or exceeds performance requirements shown in Table 11-1 below for both AM and PM Peak Hour DHV for the Design Year. Level of Service shall be calculated by Developer using methods acceptable to TxDOT.

Table 11-1: Roadway Performance Requirements

Roadway Element	Performance Criterion	Performance Measure
Mainlanes	Level of Service (LOS)	LOS C or better
Ramps, Loops, Direct Connectors, Auxiliary Lanes	LOS of merge, diverge and weaving maneuvers	LOS C or better
Frontage Roads, City Streets	LOS	LOS C or better
Signalized Intersections	Overall Volume/Capacity (*V/C*), LOS 95th percentile queues	*V/C*< 0.85 LOS C or better Queues shall not exceed available storage during critical time period (1)
	Individual movements *V/C*, LOS, 95th percentile queues	*V/C*< 0.90 LOS D or better Queues shall not exceed available storage during critical time period (1)

Notes:

(1) "Available Storage" does not include length provided for deceleration purposes. Critical time period may be either AM or PM Peak Hours on weekdays, or other time periods or days as dictated by the location and traffic conditions.

11.2.1 Control of Access

Unless shown to be deleted in the Project Schematic, Developer 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.

11.3 Deliverables

Not used.

12 DRAINAGE

12.1 General Requirements

Efficient performance of the drainage system is an integral part of the performance of the Project. Developer 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.

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, Developer is responsible for collecting all necessary data, including those elements outlined in this Section 12.2.1.

Developer 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; local floodplain requirements in FEMA-regulated floodplains; and official documents concerning the Project, such as the FEIS or other drainage and environmental studies. Water resource issues include areas with historically inadequate drainage (flooding or citizen complaints), environmentally sensitive areas, localized flooding, maintenance problems associated with drainage, and areas known to contain Hazardous Materials. Developer 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).

Developer shall acquire all applicable municipal drainage plans, watershed management plans, and records of citizen concerns. Developer 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. Developer shall also identify existing drainage areas that contribute to the highway drainage system and the estimated runoff used for design of the existing system.

Developer 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. Developer 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, Developer shall investigate and videotape or photograph the existing drainage system to determine condition, size, material, location, and other pertinent information.

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

12.2.2 Coordination with Other Agencies

Developer shall coordinate and resolve all water resource issues with affected interests and regulatory agencies. Developer shall document the resolutions of water resource issues.

12.3 Design Requirements

Developer shall design all Elements of the drainage facilities in accordance with the applicable design criteria and Good Industry Practice. Local requirements, if more stringent than those of the CDA Documents, shall supersede other requirements and be handled with a third party agreement.

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.

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

Elements of the existing drainage system within the Project limits scheduled to remain in place must meet hydraulic capacity requirements as detailed in Book 2, Section 12. If any Elements of the existing system do not comply with the requirements of Section 12 (Drainage) or Section 13 (Structures), those Elements shall be replaced by Developer.

Developer may make use of existing drainage facilities, provided overall drainage requirements for the Project are achieved.

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

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

12.3.1 Surface Hydrology

12.3.1.1 Design Frequencies

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

Table 12-1: Drainage Design Frequencies

	Design					Check Flood
Functional Classification and Structure Type	**2**	**5**	**10**	**25**	**50**	**100**
Highways (main lanes):						
♦ culverts					X	X
♦ bridges					X	X
Principal arterials:						
♦ culverts			X			X
♦ small bridges			X			X
♦ major river crossings					X	X
Minor arterials and collectors (including frontage roads):						
♦ culverts		X				X
♦ small bridges			X			X
♦ major river crossings				X		X
Local roads and streets (off-system projects):						
♦ culverts	X					X
♦ small bridges	X					X
Storm drain systems on Interstate and controlled access						
highways (main lanes):						
♦ inlets and drain pipe			X			X
♦ inlets for depressed roadways*					X	X
Storm drain systems on other highways and frontage:						
♦ inlets and drain pipe	X					X
♦ inlets for depressed roadways*				X		X

Notes.

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

12.3.1.2 Hydrologic Analysis

Developer shall design the drainage system to accommodate the ultimate development of the drainage areas. Flood damage potential for the completed Project shall not exceed pre-Project conditions. Developer shall perform hydrologic analysis for the design of drainage features to accommodate both the ultimate development of the drainage areas and interim drainage during construction.

12.3.2 Storm Sewer Systems

Where precluded from handling runoff with open channels by physical site constraints, or as directed in Book 2, Section 12, Developer shall design enclosed storm sewer systems to collect and convey runoff to appropriate discharge points.

Developer shall prepare a storm sewer drainage report encompassing all storm sewer systems that contains, at a minimum, the following items:

- 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.
- 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.
- Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and pipe alternates.
- Complete pipe profiles, including pipe size, type, and gradient; station offsets from the centerline of the roadway; length of pipe; class/gauge of pipe; and numbered drainage structures with coordinate location and elevations.

This report shall be a component of the Drainage Design Report.

Developer 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 nearest gutter;

b) the top of nearest grate inlet; and

c) the top of nearest manhole cover.

12.3.2.1 Pipes

Storm sewer pipes with design flow velocities less than 3 feet per second (fps) shall be designed for full flow at 80% of the internal diameter to account for sedimentation in the pipe. Other storm sewer pipes shall be designed using the full internal diameter. 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.

All pipes shall be reinforced concrete.

The minimum pipe size inside diameter shall be 18" for laterals, 24" for laterals placed under pavement, and 24" for trunk lines. The minimum box culvert height, inside dimension, shall be 2 feet.

The maximum spacing for pipe clean-out points (inlets and manholes) shall be 300 feet for 24", 375 feet for 36", 450 feet for 42" to 54", and 900 feet for 60" or greater.

12.3.2.2 Ponding

Developer shall design drainage systems to limit ponding, in both Ultimate Configuration and Interim Configuration, to the widths listed below for the design frequency event:

Table 12-2: Allowable Ponding Widths by Roadway Classification

Roadway Classification	Design Storm Allowable Ponding Width	Check Storm Allowable Ponding Width
Interstate, Controlled Access Highways	Low shoulder plus one-half the width of the outer lane.	One lane free of encroachment
Barrier-Separated Managed Toll Lanes: Single Lane Multiple Lanes	 Low shoulder plus 2 ft. Low shoulder plus 1 lane	Safe passage of one lane of traffic in each direction
Principal Arterials/Highways*	Low shoulder plus 1 lane	Safe passage of one lane of traffic in each direction
Ramps, Direct Connectors	Low shoulder plus 2 ft.	Safe passage of one lane of traffic
Frontage Roads	Low shoulder plus 1 lane	Safe passage of one lane of traffic in each direction
Minor Cross Streets	Width and depth to allow safe passage of one lane of traffic in each direction.	No adverse impact on adjacent property

* Highways with two or more lanes in each direction

12.3.3 Stormwater Storage Facilities

Developer shall design the stormwater storage facilities to meet requirements for water quality, water quantity, and rate control, as determined by the Texas NPDES regulations.

Developer 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.

12.3.4 Hydraulic Structures

12.3.4.1 Culverts

Developer 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 installation. 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.

12.3.4.2 Bridges

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

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

12.3.4.2.1 Method Used to Estimate Flows

Developer shall ensure that the selected hydrologic method is appropriate for the conditions in the watershed.

For all crossings located within a FEMA Flood Insurance Study (FIS) with peak flow information, Developer shall gather and utilize, as appropriate, the flow information provided in the FIS and any subsequent Letters of Map Revision (LOMR) for estimating flow.

For a crossing on the same waterway as a stream gauging station with a length of record of at least 25 years, Developer 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:

- 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.
- For crossings within the same basin but not proximate to the gauging station, transposition of gauge analysis results is allowable.
- 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.
- 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 FIS or on a gauged waterway, Developer shall select the appropriate method for calculating the design flows based on site conditions, and Good Industry Practice.

12.3.4.2.2 Design Frequency

Major river crossings, bridges, culverts and storm drain systems shall be designed for the design-year frequency corresponding to the functional classification of the associated roadway. The functional classification for each roadway is shown in Book 2, Section 11.

Developer shall evaluate bridges for contraction scour and pier scour concerns and incorporate protection in accordance with Good Industry Practice.

For interstate highways, the minimum overtopping flood to be used in the detailed design shall be the 50-year frequency.

12.3.4.2.3 Hydraulic Analysis

Developer shall design riprap at abutments in accordance with the procedures outlined in HEC-23. For bridge abutments in urban areas, Developer shall install protection in accordance with the Project's aesthetic plan.

12.3.4.2.4 Bridge/Culvert Waterway Design

For existing crossings, Developer shall analyze the existing structure with the proposed flows to ensure the headwater does not exceed that of the current conditions. If this condition is not met, Developer 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 exceed that of the corresponding event for the current condition. Culvert extensions may increase the headwater elevation, but not above the maximum allowable headwater, with respect to adjacent property and floodplain concerns.

Bridge waterway design shall maintain the existing channel morphology through the structure, if possible.

12.3.4.2.5 Bridge Deck Drainage

Runoff from bridge decks shall be carried off the bridge and into the adjacent roadway drainage system. The roadway drainage design shall include bridge approach drains to intercept gutter flow at each end of the bridge. Stormwater flowing toward the bridge shall be intercepted upstream from the approach slab. Runoff from bridge deck drainage shall be treated as required by TCEQ regulation prior to discharge to the natural waters of the State.

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.

12.3.4.2.6 Drainage Report for Major Stream Crossings

Developer shall prepare a report for each major stream crossing. Major stream crossings are defined as waterways listed on a FEMA FIS or requiring a bridge or major culvert structure. The report shall include the detailed calculations and electronic and printed copies of the computer software input and output files, as well as a discussion about hydrologic and hydraulic analysis and reasons for the design recommendations. At a minimum, for each crossing the report shall include:

Hydrology

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

Hydraulics and Recommended Waterway Opening and/or Structure

- Photographs of Site (pre- and post-construction)
- General plan, profile, and elevation of recommended waterway opening and/or structure
- 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
- Cross-sections of waterway (Developer shall provide a hard copy plot, plus any electronic data used)
- Channel profiles

Scour Analysis

- Channel cross-sections at bridge showing predicted scour
- Calculations and summary of calculations, clearly showing predicted scour and assumptions regarding bridge opening and piers used to calculate predicted scour

- Discussion of review of long-term degradation/aggradation and effects
- Recommendation for abutment protection

These reports shall be part of the Drainage Design Report.

12.4 Construction Requirements

Developer 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.

12.5 Deliverables

Developer 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:

- Record set of all drainage computations, both hydrologic and hydraulic, and all support data.
- Hydraulic notes, models, and tabulations
- Storm sewer drainage report
- Bridge and culvert designs and reports for major stream crossings
- Pond designs, including graphic display of treatment areas and maintenance guidelines for operation
- Correspondence file
- Drainage system data (location, type, material, size, and other pertinent information) in a suitable electronic format

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 CDA Documents and Good Industry Practice, in order to provide the general public a safe, reliable, and aesthetically-pleasing facility.

13.2 Design Requirements

13.2.1 Design Parameters

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

Bridges crossing over the Project shall, at a minimum, be designed to accommodate the Ultimate Configuration 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 Book 2, Section 11 for the functional classification of each roadway. Developer shall design bridge structures required for the Interim Configuration, if applicable, to the total length and span arrangement required for the Ultimate Configuration, including spanning future lanes that will be constructed below the structure as a part of the Ultimate Configuration.

Unless otherwise noted, the design of all roadway and pedestrian structural elements shall be based on the Load and Resistance Factor Design (LRFD) methodology included in TxDOT's *LRFD Bridge Design Manual.*

Developer shall design bridge structures to accommodate the Ultimate Configuration and construct bridge structures to the width required for the interim configuration. Developer shall ensure that bridges constructed for the interim configuration can be widened to the Ultimate Configuration width at a later date with minimal or no impact to aesthetics and traffic.

Direct-connect structures shall be constructed to satisfy the Ultimate Configuration. In locations where the interim configuration does not call for the construction of the direct-connect structures, Developer shall make provisions to accommodate the future construction.

13.2.2 Bridge Design Loads and Load Ratings

Developer shall provide to TxDOT both an inventory and an operating load rating of the constructed structures in accordance with TxDOT and federal rules and regulations. Load ratings shall be in accordance with AASHTO's *Manual for Condition Evaluation of Bridges.*

13.2.3 Bridge Decks and Superstructures

Timber bridges, masonry bridges, and structural plate arches are not allowed. Bridges shall not use intermediate hinges.

Developer shall minimize the number of deck joints wherever possible. Developer shall locate joints to provide for maintenance accessibility and future replacement. Joints for all grade separation structures shall be sealed.

Developer shall protect sidewalks from vehicular impact by a TxDOT-approved bridge railing as required in the TxDOT *Bridge Railing Manual* based on roadway Design Speed. For interim configuration,

pedestrian rail shall be used along structure pavement edges and installed to minimize future damage when accommodating the Ultimate Configuration.

To the extent possible, Developer shall make bridge superstructures, joints, and bearings accessible for long-term inspection and maintenance. Developer shall make open-framed superstructures accessible with walkways or by use of ladders or an under-bridge inspection truck.

Steel and concrete box girders shall be accessible without impacting traffic below; Developer shall make steel and concrete box girders with a minimum inside depth of six (6) feet to facilitate interior inspection. Developer shall include a minimum access opening diameter of 3'-0" 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. An electrical system (110 volts [V] and 220V) shall be incorporated inside the box girder with lighting and power outlets. Developer shall install air-tight and locked entryways on all hatches and points of access.

13.2.4 Bridge Foundations

Developer's bridge span arrangement and foundation locations shall accommodate the Ultimate Configuration.

Developer shall not use spread footings in locations with scour potential.

13.2.5 Bridge Railing and Barriers

All barrier systems used on the Project shall meet current crash test requirements as determined by TxDOT. All testing and associated costs for non-standard railings shall be the sole responsibility of Developer and shall be accomplished through a third party acceptable to TxDOT. TxDOT will provide a current list of standard railing in Book 2, Section 13.2.5 and will provide updated lists upon request. Developer shall protect sidewalks from vehicular impact by using TxDOT-approved bridge railings. For interim configuration, pedestrian rail shall be used along structure pavement edges and installed to minimize future damage when accommodating the Ultimate Configuration.

13.2.6 Retaining Walls

To the extent possible, Developer shall design and construct components of the interim configuration and Ultimate Configuration to provide embankments without the use of retaining walls. Where earthen embankments are not feasible, Developer may use retaining walls.

Wall types and components will be allowed only if:

- They have been accepted for general use by transportation authorities.
- Developer can demonstrate that the design of the wall type and components will perform well under the Project's environmental conditions.

Metal walls, including bin walls and sheet pile walls, recycled material walls and timber walls are not allowed. Modular walls employing interlocking blocks shall not be used where surcharge loads from vehicular traffic are present.

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.

Mechanically stabilized earth (MSE) walls shall not be used to support abutment foundations on the Project.

Reinforcement elements in permanent MSE walls shall be designed to have adequate corrosion resistance and durability to provide a 100-year service life following the completion of construction.

13.2.7 Noise/Sound Walls

Developer shall design and construct the noise/sound walls to achieve the decibel reduction requirement in the NEPA 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.

13.2.8 Drainage Structures

In developing the design of drainage structures, Developer shall account for maximum anticipated loadings in both the interim configuration and Ultimate Configuration.

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

13.2.9 Sign, Illumination, and Traffic Signal Supports

Developer shall design overhead and cantilever sign supports to accommodate the Ultimate Design configuration. Cantilever and sign bridge supports shall be placed outside the clear zone or shall be otherwise protected by appropriate safety measures.

13.3 Construction Requirements

13.3.1 Concrete Finishes

Concrete finishes shall comply with the performance requirements as stated in Book 2.

13.3.2 Structure Metals

Welding shall be in accordance with the requirements of the ANSI/AASHTO/AWS DI. 5-96 Bridge Welding Code.

13.4 Deliverables

Developer shall submit an inventory and operating ratings of constructed structures with the Record Drawings.

14 RAIL

14.1 General Requirements

This section defines the criteria required for the Project to accommodate and/or design and construct (i) a potential rail corridor within, and/or (ii) facilities and structures for rail line(s) crossing, the Project ROW.

If the Project includes a rail corridor within the Project ROW, Developer shall prepare a geometric design for the rail corridor. Developer's PMP shall set forth an approach, procedures, and methods for the rail corridor design and construction meeting the requirements set forth in the CDA Documents.

14.2 Administrative Requirements

14.2.1 Project Work Affecting Railroad Operations

Should the Project cross a railroad right of way owned by an operating railroad, Developer shall coordinate the Work with the operating railroad. Developer shall be responsible for obtaining the required approvals, permits, and agreements as required for the railroad-related Work.

14.2.2 Agreement for Construction, Maintenance, and Use of Right of Way

Whenever a license agreement for construction, maintenance, and use of railroad ROW (hereinafter called the "License Agreement") between the operating railroad and TxDOT is required, Developer shall prepare all the documentation required to obtain the License Agreement, including preparation of the License Agreement application on behalf of TxDOT, the Plans and specifications, making necessary modifications as required, and preparation of the License Agreement.

14.2.3 Operation Safety

Developer shall arrange with the operating railroad for railroad flagging as required. Developer shall comply with the operating railroad's requirements for contractor safety training prior to performing Work or other activities on the operating railroad's property.

14.2.4 Railroad Right of Entry Agreement

In order to enter the operating railroad's right-of-way to perform the Work, Developer shall secure a railroad Right of Entry Agreement and shall coordinate the arrangements of the necessary agreements directly with the operating railroad.

14.2.5 Developer Right of Entry Agreement

Developer shall cooperate and coordinate with all operating railroads for access by the operating railroad and/or their agents to the rail ROW as necessary for rail maintenance and operations activities.

14.2.6 Insurance Requirements

Developer shall procure and maintain, prior to working adjacent to and entry upon operating railroad property, insurance policies naming TxDOT, TxDOT's Consultants, and railroad as named insured.

Developer shall obtain the following types of insurance:

1. Railroad Protective Liability Insurance Policy
2. Comprehensive General Liability Insurance
3. Contractors' Protective Liability Insurance.

14.3 Design Requirements

Developer shall prepare the geometric design of the railroad Elements following Good Industry Practice and incorporating the usual and customary design standards and operating requirements of the operating railroads that has or is expected to have an agreement with TxDOT.

Developer's design shall minimize service interruptions to existing rail lines.

At highway-rail grade crossings, the roadway and drainage design parameters shall be maintained at the crossing, except that the cross slope of the pavement may be transitioned to match the grade across the rail line.

Construction details and specifications shall conform to the requirements shown in Book 2.

14.4 Construction Requirements

Developer shall comply with all construction requirements and specifications set forth by the operating railroad.

Developer shall be responsible for scheduling the work to be completed by operating Railroad as well as the work to be completed by its own forces.

14.5 Deliverables

14.5.1 Agreement for Construction, Maintenance, and Use of Right of Way

Developer shall submit the draft License Agreement to TxDOT for transmittal to the operating railroad. After all comments have been incorporated or satisfactorily resolved by Developer, railroad and TxDOT, Developer shall submit a complete and final License Agreement to TxDOT for execution.

14.5.2 Insurance

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

15 AESTHETICS AND LANDSCAPING

15.1 General Requirements

This Section 15 defines requirements with which Developer 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. Developer shall coordinate with local and State agencies to achieve this harmonization.

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:

- Material, finish, color, and texture of bridge Elements
- Materials, finish, and color of barriers and railings
- Paved slope treatments
- Finish, color, and texture of retaining and noise walls
- Contour grading, slope rounding, channel treatments, and drainage
- Sculptural and artistic features of other structures
- Light fixtures and light color
- Sidewalks, median or pedestrian specialty paving, including material, finish, and color
- Hardscape at interchanges and intersections
- Gateway and wayfinding markers
- Fencing
- Signage – overhead, attached, and ground-mounted
- Gantries
- Trees, shrubs, and other plant material
- Any permanent building construction within the Project, including ancillary support, operational, and toll collections

15.2.1 Aesthetics Concepts

Developer shall prepare three aesthetics concepts of the Project for presentation to local communities and Customer Groups. Developer 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, Developer shall meet and review the proposed aesthetics concepts with TxDOT. After meeting with the public, Developer shall prepare a final aesthetic concept and submit it to TxDOT for approval.

15.2.2 Aesthetics and Landscaping Plan

Developer shall prepare an Aesthetics and Landscaping Plan for approval by TxDOT, in its good faith discretion. This Aesthetics and Landscaping Plan shall provide guidelines and requirements for the aesthetics design of the Project. The Aesthetics and Landscaping Plan shall include all elements to fully communicate the proposed aesthetic treatment to TxDOT.

15.2.3 Personnel

Developer shall provide a landscape architect, registered in the State of Texas, with a minimum 5 years 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

Developer 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:

- The Project design shall minimize impact on the existing natural environment to the extent possible.
- The Project design shall emphasize and enhance the existing natural context and landscape to the fullest extent possible.
- Simple geometric shapes for structures shall be used to the extent possible for continuity along the entire length of the Project.
- All bridges and other structures shall be simplified in their design, and to the greatest extent possible kept small in size, bulk, and mass.
- All structures shall be carefully detailed so as to achieve the greatest level of aesthetic quality and fit within the regional context.
- Color, texture, and form shall be used amply for all structures.
- Graphics, signage, and lighting shall be consistent along the entire length of the Project.
- Existing trees and rock outcroppings shall be preserved to the greatest extent possible.
- Aesthetics Elements shall be fully integrated with the overall landscape design.
- Visual quality of the landscape shall be consistent along the entire length of the Project.
- Native-area and/or naturalized plant materials that exhibit good drought tolerance shall be used.
- Aesthetic Elements shall be easy to maintain and resistant to vandalism and graffiti.

15.3.2 Walls

Developer 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.

Developer 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.

Developer shall pay special attention to aesthetic design Elements and utilize high aesthetic quality of finishes and materials at interchanges and approaches to toll collection points.

15.3.3 Bridges and Other Structures

All aesthetic treatments for structural Elements shall be coordinated with Developer's structural design team to facilitate constructability and maintain safety requirements.

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

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*. Developer shall consult with the agricultural extension agent of the applicable county and TxDOT for recommended plant species lists.

15.4 Construction Requirements

Developer shall provide TxDOT sample panels a minimum of 60 days in advance of starting construction of textured concrete surfaces. Developer 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) 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. Developer 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, Developer 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.

15.5 Deliverables

15.5.1 Aesthetics Concepts

Developer shall submit the final aesthetic concept to TxDOT for review and approval in its good faith discretion within 60 Days of issuance of NTP1.

15.5.2 Aesthetics and Landscaping Plan

Developer shall submit the Aesthetics and Landscaping Plan to TxDOT for review and approval in its good faith discretion within 120 Days of issuance of NTP1. The Aesthetics and Landscaping Plan approval shall be a condition of issuance of NTP2.

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

16.1 General Requirements

This Section 16 includes requirements with which Developer shall design, construct, and maintain all signing, delineation, pavement markings, signalization, and lighting, for the Project.

16.2 Administrative Requirements

16.2.1 Meetings

Developer shall arrange and coordinate all meetings with local agencies that will assume responsibility for maintaining and operating traffic signals and roadway lighting. Developer shall provide TxDOT with notification of such meetings a minimum of 48 hours prior to the start of the meeting.

Developer shall arrange and coordinate all meetings with requesting agencies or individuals regarding special signs.

16.3 Design Requirements

16.3.1 Final Design

Developer shall advance the Final Design of the signing, delineation, pavement marking, signalization, and lighting based on the preliminary operational signing schematic in Book 2. If a preliminary operational signing schematic does not exist, Developer shall prepare and submit a draft plan to TxDOT for review and approval prior to commencing Final Design.

16.3.2 Permanent Signing and Delineation

Developer 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. Developer'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, DMS, lighting, and structures.

Developer shall ensure that signs are clearly visible, provide clear direction and information for users, and comply with all applicable TMUTCD requirements.

Developer 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.

Developer's design of delineators and object markers shall comply with TMUTCD requirements.

16.3.3 Project Signs – Outside the Project ROW

For signs located outside the Project ROW but within a public ROW, Developer shall install the signs in existing rights-of-way controlled by local or other State agencies. Developer shall coordinate with applicable Governmental Entities for the design and installation of such signs.

16.3.4 Advance Toll Information Signs

For advance toll information signs, Developer shall be responsible for determining sign locations and foundation types, and design and installation of the new signs.

Developer shall use Good Industry Practice in determining the locations for advance toll information signs. At a minimum, advance toll information signs shall be installed at the following locations:

- At all locations where an existing roadway provides public access to the Project
- Prior to all entrance ramps to the Project

16.3.5 Third-Party Signs

In addition to the warning, regulatory, and guide signs within the Project ROW, TxDOT or Governmental Entities may request that third-party signs, including logo signs, be installed by a third party. Developer shall coordinate and cooperate with any third party performing such work. TxDOT may solicit input from Developer 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. TxDOT may require Developer to fabricate and/or install any of these signs as a TxDOT-Directed Change.

16.3.6 Sign Support Structures

Developer 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).

Developer shall design support structures to provide a vertical clearance with the roadway of not less than 21'-0".

16.3.7 Permanent Pavement Marking

Developer shall ensure that the design and installation of all pavement markings comply with applicable TMUTCD requirements.

Developer shall mark median noses of all raised islands and inside edges of exclusive turn lanes (channelized curbs) in accordance with the requirements of TMUTCD.

16.3.8 Permanent Signalization

16.3.8.1 Traffic Signal Requirements

Developer shall design and install fully-actuated permanent traffic signals at all TxDOT-authorized intersections within Project limits. In addition, Developer shall modify, as appropriate, any existing traffic signals impacted by the Final Design. Developer shall coordinate with TxDOT and the applicable Governmental Entities to define appropriate traffic signal design requirements, local agency oversight of Developer's Work, and final acceptance of traffic signals. Developer shall coordinate with local communities for synchronization of traffic signal networks.

Developer shall provide interconnection systems between new or modified signals and any other signal system within the Project Site as required by TxDOT or the applicable local Governmental Entity. Developer shall make existing signal systems compatible with the proposed interconnections. Developer shall ensure continuous communication with the traffic signal system within the Project Site, and shall provide all communication hardware/equipment for TxDOT or the applicable local Governmental Entity to communicate with the signal systems within the Project Site.

Developer shall provide both pedestrian and vehicle detectors at all traffic signals within the Project Site.

16.3.8.2 Traffic Signal Timing Plans

Developer 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 local Governmental Entity, Developer shall be responsible for updating signal timing as necessary to maintain optimized flow.

16.3.8.3 Traffic Signal Warrants

As part of the Final Design process, Developer shall collect traffic data and prepare traffic warrant studies for intersections not signalized at the time of NTP1. The warrant studies shall address all signal warrant criteria in the TMUTCD. Developer shall make recommendations for new signal installations based on these warrant studies in consultation with TxDOT and the local Governmental Entities. TxDOT will reasonably determine if a signal or modification is required, based upon the warrant study.

All requests for signals within the Project ROW throughout the Term of the Agreement shall be subject to TxDOT approval.

Signal warrant studies shall be based on actual traffic and/or opening year traffic projections. If 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. Developer shall conduct additional traffic signal warrant studies for all intersections located in the Project ROW, commencing six months after the Project is opened for traffic. If additional signals or modifications to existing signals are warranted, based on the traffic volumes obtained through these studies, Developer 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

Developer shall coordinate with TxDOT and the local Governmental Entities to determine the type of traffic signal support structures. Developer shall obtain the maintaining local Governmental Entities' approval of traffic signal support structures to be used on new signal installations.

16.3.9 Permanent Lighting

Developer shall provide continuous roadway lighting along the highway main lanes, managed lanes, ramps, and cross streets within the Project limits.

Developer shall prepare lighting studies that consider illumination levels, uniformity, and sources for the roadways, interchanges, and special areas. Developer shall maintain an average horizontal luminance on the roadways as described in Book 2.

All third-party requests for lighting within the Project Site shall be subject to TxDOT approval.

Developer 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. Traveled roadways include: tolled lanes, general use lanes, HOV lanes, auxiliary lanes, ramps, frontage roads, and ramp terminal intersections with cross streets.

Developer shall design the lighting system to minimize or eliminate illumination of areas outside the Project ROW.

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, Developer's design shall incorporate breakaway devices that are pre-qualified by TxDOT.

Developer shall place all understructure lighting in a configuration that minimizes the need for lane closures during maintenance.

Developer shall determine and design appropriate foundation types and lengths for permanent lighting structures.

Developer 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.

Developer 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

Developer shall ensure that lighting structures comply with FAA height restrictions near airport facilities. In the event that proposed or existing luminaires, mast arms, or poles infringe into an airport's or heliport's base surface, Developer 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, Developer shall find alternative ways of providing the required level of lighting.

16.3.10 Visual Quality

Notwithstanding the requirements of Section 16.3.8 (Permanent Signalization), Developer shall make a reasonable attempt to provide luminaires of equal height along the roadway.

The use of timber poles for permanent installation is prohibited.

16.4 Construction Requirements

16.4.1 Permanent Signing and Delineation

Developer 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.

Developer 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. Developer shall replace any other removed signs before the end of the work day.

Developer shall affix a sign identification decal to the back of all signs for inventory purposes and shall submit inventory information to TxDOT in a TxDOT-compatible format.

All installed signs are required to meet the minimum retro-reflectivity values specified in Table 16-2 (Retroreflectivity Values).

Table 16-2: Retroreflectivity Values

Sign Colors	Sheeting Type (ASTM D4956-04)				Additional Criteria
	I	II	III	VII, VIII, IX	
White on Green	W*; G _	W*; G 15	W*; G 25	W 250; G 25	Overhead
	W*; G 7	W 120; G 15			Ground-mounted
Black on Orange or Black on Yellow	Y*; O*	W _50; G 50			See Note 1
	Y*; O*	W 75; G 75			See Note 2
White on Red	W 35; R 7				See Note 3
Black on White	W 50				—

Notes:

The minimum maintained retro-reflectivity levels shown in this table are in units of candelas per lux per square meter (cd/lx/m^2), measured at an observation angle of 0.2° and an entrance angle of -4.0°.

1 For text and fine symbol signs measuring at least 1200 millimeters (mm) (48 inches) and for all sizes of bold symbol signs

2 For text and fine symbol signs measuring less than 1200 mm (48 inches)

3 Minimum Sign Contrast Ratio _ 3:1 (white retroreflectivity ÷ red retroreflectivity)

* This sheeting type should not be used for this color for this application.

Bold Symbol Signs

W1-1, -2 – Turn and Curve
W1-3, -4 – Reverse Turn and Curve
W1-5 – Winding Road
W1-6, -7 – Large Arrow
W1-8 – Chevron
W1-10 – Intersection in Curve
W1-11 – Hairpin Curve
W1-15 – 270 Degree Loop
W2-1 – Cross Road
W2-2, -3 – Side Road
W2-4, -5 – T and Y Intersection
W2-6 – Circular Intersection
W3-1 – Stop Ahead
W3-2 – Yield Ahead
W3-3 – Signal Ahead
W4-1 – Merge
W4-2 – Lane Ends
W4-3 – Added Lane
W4-5 – Entering Roadway Merge
W4-6 – Entering Roadway Added Lane
W6-1, -2 – Divided Highway Plaques Begins and Ends
W6-3 – Two-Way Traffic
W10-1, -2, -3, -4, -11, -12 – Highway-Railroad Advance
W11-2 – Pedestrian Crossing
W11-3 – Deer Crossing
W11-4 – Cattle Crossing
W11-5 – Farm Equipment
W11-6 – Snowmobile Crossing
W11-7 – Equestrian Crossing
W11-8 – Fire Station
W11-10 – Truck Crossing
W12-1 – Double Arrow
W16-5p, -6p, -7p – Pointing Arrow Plaques
W20-7a – Flagger
W21-1a – Worker

Fine Symbol Signs – Symbol signs not listed as Bold Symbol Signs.

Special Cases

W3-1–Stop Ahead: Red retroreflectivity, 7

W3-2–Yield Ahead: Red retroreflectivity, 7, White retroreflectivity, 35

W3-3–Signal Ahead: Red retroreflectivity, 7, Green retroreflectivity, 7

W3-5–Speed Reduction: White retroreflectivity,_50

For non-diamond-shaped signs such as W14-3 (No Passing Zone), W4-4p (Cross Traffic Does Not Stop), and W13-1, -2, -3, -5 (Speed Advisory Plaques), use largest sign dimension to determine proper minimum retroreflectivity level.

16.4.2 Permanent Pavement marking

Refer to Book 2, Section 16.

16.4.3 Permanent Signalization

Developer shall coordinate with the Utility Owner(s) and ensure necessary power service is initiated and maintained for permanent signal systems. Developer shall ensure power is provided to all Developer-installed signals.

16.4.4 Permanent Lighting

Developer 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, Developer shall maintain existing lighting as temporary lighting during construction and restore or replace prior to Substantial Completion

Developer shall affix an identification decal on each luminaire, ground box, and electrical service maintained and/or operated by Developer for inventory purposes and shall submit inventory information to TxDOT in a TxDOT-compatible format. This identification shall denote that these are property of Developer and shall provide a contact phone number and address in the event of Emergency or necessary maintenance.

16.5 Deliverables

All deliverables shall be presented to TxDOT in both hardcopy, and electronic form compatible with TxDOT software.

16.5.1 Permanent Signing and Delineation

Before placing any permanent signs, delineation, advance toll warning signs, third-party signs, or non-standard sign structures, Developer shall stake each sign location in the field and provide TxDOT 72 hours notice prior to installation of any sign.

16.5.2 Permanent Pavement Marking

Before placing any permanent pavement markings, Developer shall provide TxDOT a layout indicating the proposed location of such items.

16.5.3 Permanent Signalization

Developer shall provide TxDOT with copies of all signal warrant studies as required in this Section 16. Developer shall also provide copies of all final signal timing.

Before placing any permanent traffic signals, Developer shall provide TxDOT a layout indicating the proposed location of such items.

16.5.4 Permanent Lighting

Before placing any permanent lighting, Developer shall provide TxDOT a layout indicating the proposed location of such items.

Developer shall provide TxDOT the photometric data results for all lighted areas within the Project limits.

17 INTELLIGENT TRANSPORTATION SYSTEMS

17.1 General Requirements

An Intelligent Transportation System (ITS) is necessary for monitoring the Project's traffic flow and performance. The Project ITS must accurately detect traffic and traffic operational conditions throughout the Project limits, and clearly communicate relevant and useful travel information to the people using the facility.

TxDOT may already be operating an ITS network that will need to connect to the new system provided by Developer. The Project ITS must be compatible with such in-place system(s) that TxDOT and other agencies (including other developers) are currently operating. Developer shall coordinate the ITS planning and implementation with TxDOT and other Governmental Entities that have roadways within or intersecting the Project.

17.2 Design Requirements

Developer 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.

Subject to the specific requirements of this Section 17, Developer shall determine the number and specific locations of all ITS components.

Developer shall provide safe ingress/egress areas and structures to accommodate authorized personnel access to ITS components for maintenance and operation activities.

17.2.1 ITS Communications Requirements

Developer shall provide a communications network that has redundant routing capabilities. The communications network shall serve the highway ITS components along the highway Elements of the Project. Where necessary, as determined by TxDOT, Developer shall provide communication node buildings and cabinets to support the communications network.

17.2.2 Conduit

Developer 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.

Developer shall repair each communication cable or electrical conductor that is severed or otherwise rendered not usable.

17.2.3 CCTV Cameras

Developer shall provide CCTV cameras for Incident verification and traffic management.

17.2.3.1 Equipment

Developer shall provide all necessary CCTV equipment, including cameras, camera controls, cables, and connections.

Developer shall provide a digital video format and communications protocol at all connections with TxDOT systems. The format and protocol provided by Developer 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

Developer shall provide overlapping roadway coverage by CCTV cameras for all highway lanes to provide redundant camera field of view. CCTV cameras shall be placed to enable Developer and 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, Developer shall mount cameras on dedicated structures unless otherwise approved by TxDOT.

17.2.3.3 Video Requirements

Developer shall provide state-of-the-art CCTV cameras that meet the following requirements:

- Solid-state design with digital signal processing (DSP) for digital zoom
  - for auto/manual long-term integration (exposure) control, with built-in frame buffer
  - for auto-focus; for built-in I.D. generator, with white letters and black outline
- Conformance to a minimum of National Television Systems Committee (NTSC) video output and Electronic Industries Association (EIA)-170A standards
- No less than 30 frames per second (fps) color
- Able to produce clear, low-bloom, low-lag video pictures under all conditions, from bright sunlight to nighttime scene illumination of 0.02 foot-candles
- Maintenance of color quality by a continuous, through-the-lens, automatic, white balance for color temperatures from 2850 degrees Kelvin to greater than 5100 degrees Kelvin, with less than 10 Institute of Radio Engineers (IRE) units unbalance
- Aspect ratio of 4:3
- Zero geometric distortion
- Signal to noise distortion of 55 dB with AGC off
- Built-in auto focus and auto iris
- Overexposure protection to prevent permanent damage to cameras when pointed at strong light sources, including the sun, for brief periods of time

17.2.3.4 Operating Requirements

Developer shall provide cameras with built-in heaters, mounting structure, and related equipment capable of operating within the following weather conditions:

- Wind load of 80 mph without permanent damage to mechanical and electrical equipment
- Ambient temperature range of -35 degrees Fahrenheit to +130 degrees Fahrenheit
- Relative humidity range not to exceed 95 percent within the temperature range of +40 degrees Fahrenheit to +110 degrees Fahrenheit
- Humidity range of 0 to 100 percent condensing

17.2.3.5 Control Requirements

Developer shall provide cameras and related equipment capable of operating with the following pan-tilt unit requirements:

- Vertical movement of + 40 degrees to – 90 degrees
- Horizontal movement of 360 degrees
- Tilt speed of 20 degrees per second
- Pan speed of 100 degrees per second
- Simultaneous pan and tilt
- RS-232 serial communications

17.2.4 Vehicle Detection

Developer shall provide permanent detection in each highway lane of the Project that measures vehicle classification, vehicular volume, lane occupancy, and speed information on the roadway. The detectors shall be non-intrusive to the roadway users. Spacing for the permanent vehicle detection shall be no greater than 0.75 miles in each highway lane in the Project, or, at a minimum, provide one detector in each highway lane between interchanges, each entrance ramp lane, and each exit ramp lane.

Developer 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, Developer shall install a mounting pole solely for the vehicle detector. Any mounting poles placed specifically for ITS items shall conform to TxDOT specifications for CCTV mounting poles

17.2.5 Dynamic Message Signs (DMS)

Developer shall provide a comprehensive network of electronic DMS.

Developer shall position each DMS to allow motorists to safely view the messages being displayed. Developer shall locate the DMS to comply with large guide sign spacing stated in the TMUTCD.

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.

17.2.6 Lane Control Signals (LCS)

Developer shall place LCS over through travel lanes on existing or proposed overhead sign structures. Maximum spacing of LCS shall not exceed one mile.

17.3 Construction Requirements

17.3.1 General

Developer shall notify TxDOT 30 days in advance of making connections to the existing TxDOT system.

Developer shall maintain existing ITS communications functionality during construction activities. Developer shall coordinate with Utility Owner(s) and ensure that power service is available for permanent ITS systems.

17.3.2 Salvaging Existing Items

TxDOT reserves the right to require Developer, 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 Developer to salvage and deliver to a reasonable location designated by TxDOT any ITS equipment and materials in an undamaged condition.

17.3.3 Existing ITS Relocation

Developer shall relocate any existing ITS components, including hubs, satellite buildings, CCTV cameras, DMSs, detection devices, and fiber-links, as required to continue service from the existing components. Developer shall sequence construction and relocation of existing ITS components, facilities, and systems to prevent lapses in TxDOT's receipt of video or data within the Project area. The existing physical links and the proposed physical links shall be in separate physical conduits.

Before removing existing ITS items and before beginning construction of segments without existing ITS, Developer shall perform all activities necessary to maintain system operations during construction, including installing new ITS items, relocating or replacing existing ITS items, and connecting such ITS items to the existing network.

17.4 Deliverables

Not used.

18 TRAFFIC CONTROL

18.1 General Requirements

Developer 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.

18.2 Administrative Requirements

18.2.1 Traffic Management Plan

Developer shall develop, implement, and maintain a Traffic Management Plan (TMP) that includes the following items:

- Descriptions of the qualifications and duties of the traffic engineering manager, traffic control coordinator, and other personnel with traffic control responsibilities
- Procedures to identify and incorporate the needs of transit operators, Utility Owners, Governmental Entities, local governmental agencies, Emergency Service providers, school districts, business owners, and other related Users, Customer Groups or entities in the Project corridor and surrounding affected areas
- 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
- Procedures for signing transitions during construction from one stage to the next and from interim to permanent signing
- Procedures for maintenance and replacement of traffic control devices, including pavement markings and traffic barriers, if used
- Procedures to regularly evaluate and modify, if necessary, traffic signal timings, and the procedures for the development, TxDOT approval, implementation, testing, and maintenance of all affected signals
- Procedures to coordinate with the appropriate Governmental Entities operating signal networks along the Project or Project detour routes to ensure temporary system compatibility, establish responsibilities for temporary signal installation, maintenance, operation and removal, and coordinate traffic signal timing with local signal networks
- Procedures and process for the safe ingress and egress of construction vehicles in the work zone
- Provisions to provide continuous access to established truck routes and Hazardous Material (HazMat) routes, and to provide suitable detour routes, including obtaining any approvals required by the appropriate governmental entities for these uses
- Procedures to modify plans as needed to adapt to current Project circumstances
- Procedures to communicate TMP information to Developer's public information personnel and notify the public of maintenance of traffic issues in conjunction with the requirements of Book 2, Section 3
- Descriptions of contact methods, personnel available, and response times for any deficiencies or Emergency conditions requiring attention during off-hours.

18.3 Design Requirements

18.3.1 Traffic Control Plans

Developer 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.

Developer shall produce a traffic control plan for each and every phase of Work that impacts traffic and involves traffic control details. 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 as described in Book 2, Section 18.

Developer shall maintain signing continuity on all active roadways within or intersecting the Project at all times.

Throughout the duration of the Project, Developer shall ensure all streets and intersections remain open to traffic to the greatest extent possible by constructing the Work in stages. Developer 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.

Developer shall prepare public information notices, in coordination with Section 3 (Public Information and Communications), in advance of the implementation of any lane closures or traffic switches. These notices shall be referred to as Traffic Advisories.

18.4 Construction Requirements

Construction shall be in accordance with Developer's TMP, the manufacturer's directions or recommendations where applicable, and the applicable provisions of the TMUTCD.

18.4.1 Developer Responsibility

If at any time TxDOT determines Developer's traffic control operations do not meet the intent of the TMP or any specific traffic control plan, Developer shall immediately revise or discontinue such operations to correct the deficient conditions.

Developer 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

Developer 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.

18.5 Deliverables

18.5.1 Traffic Management Plan

The TMP must be approved by TxDOT prior to the start of construction activities. Developer 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.

18.5.2 Traffic Control Plans

Each traffic control plan shall be submitted to TxDOT for review a minimum of 10 Days prior to implementation

19 MAINTENANCE

19.1 General Requirements

Developer shall maintain the Project in a manner that provides a safe and reliable transportation system for improved mobility.

19.1.1 General Maintenance Obligations

Developer shall take all necessary actions to achieve the following:

- Maintain the Project and Related Transportation Facilities in a manner appropriate for a facility of the character of the Project.
- Minimize delay and inconvenience to Users and, to the extent Developer is able to control, users of Related Transportation Facilities.
- Identify and correct all Defects and damages from Incidents
- 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.
- Remove debris, including litter, graffiti, animals, and abandoned vehicles or equipment from the Project ROW.
- Minimize the risk of damage, disturbance, or destruction of third-party property during the performance of maintenance activities.
- Coordinate with and enable TxDOT and others with statutory duties or functions in relation to the Project or Related Transportation Facilities to perform such duties and functions.
- Perform systematic Project inspections, periodic maintenance, and routine maintenance in accordance with the provisions of Developer's Maintenance Management Plan and Developer's Safety Plan.

Developer 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 in Table 19-1.

19.2 Maintenance Management Plan (MMP)

Developer 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 Agreement. 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 Related Transportation 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. Developer 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 Developer, and response times for other Defects. Developer 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 Agreement 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 Agreement.

19.2.1 Maintenance During Work

Developer shall be responsible for maintenance and repairs to any portion of the Work until Substantial Completion is issued in accordance with the Agreement. The Work shall include routine maintenance (such as litter pickup, mowing, and repair of third-party-damaged traffic control and safety devices), responding to emergencies and operational problems, and inspections and repairs required on an as-needed basis or as directed by TxDOT until issuance of Substantial Completion. Upon Substantial Completion, and provided that TxDOT does not implement the Capital Maintenance Agreement, TxDOT shall assume the maintenance obligations. If Developer fails to perform such maintenance within 10 Business Days of discovery of the need for the work, TxDOT reserves the right to perform such work as it deems necessary with its own forces, and/or to enter into special contracts for the maintenance of specific items.

19.3 Deliverables

Developer 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.

Table 19-1: Performance and Measurement Table Baseline

Performance and Measurement Table Baseline									
ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
1) ROADWAY									
							Unless stated otherwise, measurements shall be conducted using procedures, techniques, and measuring equipment consistent with TxDOT's *Pavement Management Information System Rater's Manual.* Unless otherwise stated, pavement performance measurement records relate to 0.5-mile sections as described in the *Pavement Management Information System Rater's Manual.*		
	1.1	Obstructions and debris	Roadway and clear zone free from obstructions and debris	2 hrs	N/A	N/A	Visual Inspection	Number of obstructions and debris	Nil
	1.2	Pavement	All roadways have a smooth surface course (including bridge decks, covers, gratings, frames and boxes) with adequate skid resistance and free from Defects.	24 hrs	28 days	6 months	**a) Pavement Condition Score** Measurements and inspections necessary to derive Pavement Condition Score	Pavement Condition Score for 80% of Auditable Sections exceeding: • Mainlanes and ramps – 90 • Frontage roads – 80 Pavement Condition Score for each Auditable Section exceeding: • Mainlanes and ramps – 80	100% 100% 100%

* - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice.

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
								• Frontage roads – 70	100%
	1.2 cont						**b) Ruts – Mainlanes, shoulders & ramps** Depth as measured using an automated device in compliance with TxDOT Standards.	Percentage of wheel path length with ruts greater than ¼" in depth in each Auditable Section	
								• Mainlanes, shoulders and ramps – 3%	Nil
								• Frontage roads – 10%	Nil
							10ft straight edge used to measure rut depth for localized areas.	Depth of rut at any location greater than 0.5"	Nil
							c) Ride quality Measurement of International Roughness Index (IRI) according to TxDOT standard Tex-1001-S, Operating Inertial Profilers and Evaluating Pavement Profiles	For 80% of all Auditable Sections measured, IRI throughout 98% of each Auditable Section is less than or equal to:	100%
								• Mainlanes, ramps – 95" per mile**	100%
								• Frontage roads – 120" per mile**	

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	1.2 cont			24 hrs	28 days	6 months	** To allow for measurement bias, an adjustment of -10 (minus ten) is made to IRI measurements for concrete pavements before assessing threshold compliance.	IRI measured throughout 98% of Auditable Section of less than or equal to: • Mainlanes, ramps 120" per mile** • Frontage roads – 150" per mile**	100% 100%
							(Renewal Work and new construction subject to construction quality standards)	Mainlanes, ramps, 0.1 mile average – 150" per mile** Frontage roads, 0.1 mile average – 180" per mile** IRI measured throughout 98% of each lane containing a bridge deck in any Auditable Section , 0.1 mile average – 200" per mile**	100% 100% 100%
							3-ft straightedge used to measure discontinuities	Individual discontinuities greater than 0.75"	Nil
							d) Failures Instances of failures exceeding the failure criteria set forth in the TxDOT PMIS Rater's Manual, including potholes,	Occurrence of any failure	Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
							base failures, punchouts and jointed concrete pavement failures		
	1.2 cont			24 hrs	28 days	6 months	**e) Edge drop-offs** Physical measurement of edge drop-off level compared to adjacent surface	Instances of edge drop-off greater than 2" (Number)	Nil
							f) Skid resistance ASTM E 274 Standard Test Method for Skid Resistance Testing of Paved Surfaces at 50 MPH using a full scale smooth tire meeting the requirements of ASTM E 524 .	• Mainlanes, shoulders and ramps – Number of sections investigated as to potential risk of skidding accident and appropriate remedial action taken where average Skid Number for 0.5-mile section of mainlanes, shoulders and ramps are in excess of 30.	100%
								• Frontage roads –Number of sections investigated as to potential risk of skidding accident and appropriate remedial action taken where average Skid Number for 0.5-mile section of frontage roads is in excess of 30.	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	1.2 cont							• When the Skid Number is below 25 and/or when required by the Wet Weather Accident Reduction Program, areas categorized as high risk, the Concessionaire shall perform a site investigation and perform required corrective action.	100%
			Road users warned of potential skidding hazards	24hrs	7days	N/A	**Skid resistance** (as above)	Instances where road users warned of potential skidding hazard where remedial action is identified.	100%
	1.3	Crossovers and other paved areas	Crossovers and other paved areas are free of Defects	24 hrs	28 days	6 months	**a) Potholes** **b) Base failures**	Potholes of low severity or higher (Number) Base failures of low severity or higher (Number)	Nil Nil
	1.4	Joints in concrete	Joints in concrete paving are sealed and watertight Longitudinal joint separation	24 hrs	28 days	6 months	Visual inspection of joints Measurement of joint width and level difference of two sides of joints	Length unsealed joints greater than ¼" Joint width more than 1" or faulting more than ¼"	Nil Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitiga-tion	Cat 1 Perma-nent Remedy	Cat 2 Perma-nent Repair			
	1.5	Curbs	Curbs are free of defects	24 hrs	28 days	6 months	Visual inspection	Length out of alignment	Nil
2) DRAINAGE									
	2.1	Pipes and Channels	Each element of the drainage system is maintained in its proper function by cleaning, clearing and/or emptying as appropriate from the point at which water drains from the travel way to the outfall or drainage way.	24 hrs	28 days	6 months	Visual inspection supplemented by CCTV where required to inspect buried pipe work	Length with less than 90% of cross section clear (feet)	Nil
	2.2	Drainage treatment devices	Drainage treatment and balancing systems, flow and spillage control devices function correctly and their location and means of operation is recorded adequately to permit their correct operation in Emergency.	24 hrs	28 days	6 months	Visual inspection	Devices functioning correctly with means of operation displayed (Number)	100%
	2.3	Travel Way	The travel way is free from water to the extent that such water would represent a hazard by virtue of its position and depth.	24 hrs	28 days	6 months	Visual inspection of water on surface	Instances of hazardous water build-up	Nil
	2.4	Discharge systems	Surface water discharge systems perform their proper function and discharge to groundwater and waterways	24 hrs	28 days	6 months	Visual inspection and records	Non-compliances with legislation	Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
			complies with the relevant legislation and permits.						
	2.5	Protected Species	Named species and habitats are protected.	24 hrs	28 days	6 months	Visual inspection	Compliance with the requirement	100%
3) STRUCTURES									
	3.1	Structures having an opening measured along the centre of the roadway of more than 20 feet between undercopings of abutments or springlines of arches or extreme ends of openings or multiple boxes	Substructures and superstructures are free of: • graffiti • undesirable vegetation • debris and bird droppings • blocked drains, weep pipes manholes and chambers • blocked drainage holes in structural components • defects in joint sealants • defects in pedestrian protection measure • scour damage • corrosion of rebar • paint system failures • impact damage	24 hrs	28 days	6 months	Inspection and assessment in accordance with the requirements of federal National Bridge Inspection Standards (NBIS) of the Code of Federal Regulations, 23 Highways – Part 650, the TxDOT Bridge inspection Manual, and the Federal Administration's Bridge Inspector's Reference Manual.	Records as required in the TxDOT Bridge Inspection Manual Occurrences of condition rating below seven for any deck, superstructure or substructure All condition states to be one for all structure components	Nil 100%
	3.2	Structure components	i) Expansion joints are free of: • dirt debris and vegetation • defects in drainage systems	24 hrs	28 days	6 months	Inspection and assessment in accordance with the requirements of federal National Bridge Inspection	Records as required in the TxDOT Bridge Inspection Manual	Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
			• loose nuts and bolts • defects in gaskets ii) The deck drainage system is free of all and operates as intended. iii) Parapets are free of: • loose nuts or bolts • blockages of hollow section drain holes • graffiti				Standards (NBIS) of the Code of Federal Regulations, 23 Highways – Part 650, the TxDOT Bridge inspection Manual, and the Federal Administration's Bridge Inspector's Reference Manual..	Occurrences of condition rating below seven for any deck, superstructure or substructure All condition states to be one for all structure components	100%
	3.2 cont.		• vegetation • accident damage iv) Bearings and bearing shelves are clean. v) Sliding and roller surfaces are clean and greased to ensure satisfactory performance. Additional advice contained in bearing manufacturers' instructions in the Structure Maintenance Manual is followed. Special finishes are clean and perform to the appropriate standards. vii) All non-structural items such as hoists and electrical fixings, operate correctly,	24 hrs	28 days	6 months			

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Perma-nent Remedy	Cat 2 Perma-nent Repair			
			are clean and lubricated as appropriate, in accordance with the manufacturer's recommendations and certification of lifting devices is maintained.						
	3.3	Non-bridge class culverts	Non-bridge-class culverts are free of: • vegetation and debris and silt • defects in sealant to movement joints • scour damage	24 hrs	28 days	6 months	Visual inspection	Number with vegetation, debris and silt Number with defects in sealant and movement joints Number with scour damage	Nil Nil Nil
	3.4	Gantries and high masts	Sign signal gantries, high masts are structurally sound and free of: • loose nuts and bolts • defects in surface protection systems • graffiti	24 hrs	28 days	6 months	Visual inspection	Number with loose assemblies Number with defects in surface protection Number with graffiti	Nil Nil Nil
	3.5	Load ratings	All structures maintain the design load capacity.	24 hrs	28 days	6 months	Load rating calculations in accordance with the Manual for Bridge Evaluation and the TxDOT Bridge Inspection Manual. Load restriction requirements as per the TxDOT Bridge Inspection Manual	Number of load restrictions for Texas legal loads (including legally permitted vehicles)	Nil

* - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice.

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Perma-nent Remedy	Cat 2 Perma-nent Repair			
4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS									
	4.1	Pavement markings	Pavement markings are: • clean and visible during the day and at night • whole and complete and of the correct color, type, width and length • placed to meet the TMUTCD and TxDOT's Pavement Marking Standard Sheets	24 hrs	28 days	6 months	a) Markings - General Portable retroreflectometer, which uses 30 meter geometry meeting the requirements described in ASTM E 1710	Length meeting the minimum retroreflectivity 175 mcd/sqm/lx for white Length meeting the minimum retroreflectivity 125 mcd/sqm/lx for yellow	100% 100%
							Physical measurement	Length with more than 5% loss of area of material at any point Length with spread more than 10% of specified dimensions.	Nil Nil
							b) Profile Markings Visual inspection	Length performing its intended function and compliant with relevant regulations	100%

* - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice.

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	4.2	Raised reflective markers	Raised reflective pavement markers, object markers and delineators are: • clean and clearly visible • of the correct color and type • reflective or retroreflective as TxDOT standard • correctly located, aligned and at the correct level • are firmly fixed • are in a condition that will ensure that they remain at the correct level.	24 hrs	28 days	6 months	Visual inspection	Number of markers associated with road markings that are ineffective in any 10 consecutive markers. (Ineffective includes missing, damaged, settled or sunk) [A minimum of four markers should be visible at 80' spacing when viewed under low beam headlights] Uniformity (replacement rpms having equivalent physical and performance characteristics to adjacent markers).	Nil 100%
	4.3	Delineators & Markers	Object markers, mail box markers and delineators are: • clean and visible • of the correct color and type • legible and reflective • Straight and Vertical	24 hrs	28 days	6 months	Visual inspection	Number of object markers or delineators defective or missing	Nil

* - Items in these columns shall be reviewed annually by Developer as part of the MMP to comply with Technical Documents and/or Good Industry Practice.

Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS									
	5.1	Guard rails and safety barriers	All guardrails, safety barriers, concrete barriers, etc... are maintained free of Defects. They are appropriately placed and correctly installed at the correct height and distance from roadway or obstacles. Installation and repairs shall be carried out in accordance with the requirements of NCHRP 350 standards.	24 hrs	28 days	6 months	Visual inspection	Length of road restraint systems correctly installed Length free from defects Length at correct height Length at correct distance from roadway and obstacle	100% 100% 100% 100%
	5.2	Impact attenuators	All impact attenuators are appropriately placed and correctly installed	24 hrs	7 days	6 months	Visual inspection	Number correctly placed and installed	100%
6) TRAFFIC SIGNS									
	6.1	General – All Signs	i) Signs are clean, correctly located, clearly visible, legible, reflective, at the correct height and free from structural and electrical defects ii) Identification markers are provided, correctly located, visible, clean and legible	24 hrs	28 days	6 months	**a) Retroreflectivity** Coefficient of retro reflectivity **b) Face damage** Visual inspection	Number of signs with reflectivity below the requirements of TxDOT's TMUTCD Number of signs with face damage greater than 5% of area	Nil Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	6.1 cont.		iii) Sign mounting posts are vertical, structurally sound and rust free				**c) Placement** Visual inspection	Signs are placed in accordance with TxDOT's Sign Crew Field Book including not twisted or leaning	100%
			iv) All break-away sign mounts are clear of silt or other debris that could impede break-away features and shall have correct stub heights				**d) Obsolete signs** Visual inspection	Number of obsolete signs	Nil
			v) Obsolete and redundant signs are removed or replaced as appropriate vi) Visibility distances meet the stated requirements vii) Sign information is of the correct size, location, type and wording to meet its intended purpose and any statutory requirements viii) All structures and elements of the signing system are kept clean and free from debris and have clear access provided. ix) All replacement and repair materials and equipment are in accordance with the				**e) Sign Information** Visual inspection	Sign information is of the correct size, location, type and wording to meet its intended purpose	100%
							f) Dynamic Message Signs Visual inspection	Dynamic message signs are fully functioning	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
			requirements of the TMUTCD x) Dynamic message signs are in an operational condition						
	6.2	General - Safety critical signs	Requirements as 6.1, Plus: "Stop," "Yield," "Do Not Enter," "One Way" and "Wrong Way" signs are clean legible and undamaged.	2hrs	1 week	6 months	Visual inspection	Number of damaged Safety critical signs	Nil
7) TRAFFIC SIGNALS									
	7.1	General	i) Traffic Signals and their associated equipment are: • clean and visible • correctly aligned and operational • free from damage caused by accident or vandalism • correctly aligned and operational ii) Signal timing and operation is correct iii) Contingency plans are in place to rectify Category 1 defects not immediately repairable to assure alternative traffic control is provided during a period of failure	2 hrs	24 hrs	6 months	**a) General condition** Visual inspection **b) Damage** Visual inspection **c) Signal timing** Timed measurements **d) Contingency plans** Records Review	Signals are clean and visible Signals are undamaged Installations have correct signal timings Full contingency plans are in place	100% 100% 100% 100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	7.2	Soundness	Traffic Signals are structurally and electrically sound	24 hrs	28 days	6 months	**a) Structural soundness** Visual inspection **b) Electrical soundness** Testing to meet NEC regulations	Inspection records showing safe installation and maintenance	100%
	7.3	Identification marking	Signals have identification markers and the telephone number for reporting faults are correctly located, clearly visible, clean and legible	N/A	28 days	6 months	Visual inspection	Inspection records showing identification markers and other information are easily readable	100%
	7.4	Pedestrian Elements and Vehicle Detectors	All pedestrian elements and vehicle detectors are correctly positioned and fully functional at all times	24 hrs	28 days	6 months	Visual Inspection	Inspection records showing compliance	100%
8) LIGHTING									
	8.1	Roadway Lighting – General	i) All lighting is free from defects and provides acceptable uniform lighting quality ii) Lanterns are clean and correctly positioned iii) Lighting units are free from accidental damage or vandalism iv) Columns are upright, correctly founded, visually acceptable and structurally sound	24 hrs	28 days	6 months	**a) Mainlane lights operable** Night time inspection or automated logs **b) Mainlane lights out of action** Night time inspection or automated logs	Number of sections with less than 90% of lights functioning correctly at all times Instances of more than two consecutive lights out of action	Nil Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	8.2	Sign Lighting	Sign lighting is fully operational	24 hrs	28 days	6 months	Night time inspection or automated logs	Instances of more than one bulb per sign not working	Nil
	8.3	Electrical Supply	Electricity supply, feeder pillars, cabinets, switches and fittings are electrically, mechanically and structurally sound and functioning	24 Hrs	7 Days	1 Month	Testing to meet NEC regulations, visual inspection	Inspection records showing safe installation and maintenance	100%
	8.4	Access Panels	All access panels in place at all times.	24 Hrs	7 Days	1 Month	Visual Inspection	Instances of missing access panels	Nil
	8.5	High Mast Lighting	i) All high mast luminaries functioning on each pole ii) All obstruction lights are present and working (if required) iii) Compartment door is secure with all bolts in place iv) All winch and safety equipment is correctly functioning and maintained without rusting or corrosion (for structural requirements refer to Element Category 3)	24 hrs	48 hrs	1 Month	Yearly inspection and night time inspections or automated logs	Instances of two or more lamps not working per high mast pole Identification of other defects	Nil Nil
9) FENCES, WALLS AND SOUND ABATEMENT									
	9.1	Design and Location	Fences and walls act as designed and serve the purpose for which they were intended	24 hrs	28 days	6 months	Visual Inspection	Inspection records showing compliance	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	9.2	Construction	Integrity and structural condition of the fence is maintained	24 hrs	28 days	6 months	Structural assessment if visual inspection warrants	Inspection records showing compliance	100%
10) ROADSIDE MANAGEMENT									
	10.1	Vegetated Areas – Except landscaped areas – General	Vegetation is maintained so that: i) Height of grass and weeds is kept within the limits described for urban and rural areas. Mowing begins before vegetation reaches the maximum height.	24 hrs	7 days	28 days	**a) Urban areas** Physical measurement of height of grass and weeds	Individual measurement areas to have 95% of height of grass and weeds between 5 in. and 18 in	100%
			ii) Spot mowing at intersections, ramps or other areas maintains visibility of appurtenances and sight distance.				**b) Rural areas** Physical measurement of height of grass and weeds	Individual measurement areas to have 95% of height of grass and weeds between 5 in. and 30 in	100%
			iii) Grass or vegetation does not encroach into or on paved shoulders, main lanes, sidewalks, islands, riprap, traffic barrier or curbs.				**c) Encroachment** Visual inspection of instances of encroachment of vegetation	Occurrences of vegetation encroachment in each auditable section	Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Perma-nent Remedy	Cat 2 Perma-nent Repair			
	10.1 cont.		iv) A herbicide program is undertaken in accordance with the TxDOT Herbicide Manual to control noxious weeds and to eliminate grass in pavement or concrete.	24 hrs	7 days	28 days	**d) Wildflowers** Visual Inspection with audit of process.	Adherence to vegetation management manuals	100%
			v) A full width mowing cycle is completed after the first frost.				**e) Sight lines** Visual inspection	Instances of impairment of sight lines or sight distance to signs	Nil
			vi) Wildflowers are preserved utilizing the guidelines in the mowing specifications and TXDOT *Roadside Vegetation Manual.*						

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	10.2	Landscaped Areas	i) All landscaped areas are maintained to their originally constructed condition. Landscaped areas are as designated in the plans. ii) Mowing, litter pickup, irrigation system maintenance and operation, plant maintenance, pruning, insect, disease and pest control, fertilization, mulching, bed maintenance, watering is undertaken as per FMP. iii) The height of grass and weeds is kept between 2" and 8". Mowing begins before vegetation reaches 8 in iv) Damaged or dead vegetation is replaced.	24 hrs	7 days	28 days	Visual inspection	Inspection records showing compliance	100%
	10.3	Fire Hazards	Fire hazards are controlled	24 hrs	7 days	28 days	Visual inspection	Instances of dry brush or vegetation forming fire hazard	Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	10.4	Trees, brush and ornamentals	i) Trees, brush and ornamentals on the right of way, except in established no mow areas, are trimmed in accordance with TxDOT standards. ii) Trees, brush and ornamentals are trimmed to insure they do not interfere with vehicles or sight distance, or inhibit the visibility of signs. iii) Dead trees, brush, ornamentals and branches are removed. Potentially dangerous trees or limbs are removed. iv) All undesirable trees and vegetation are removed. Diseased trees or limbs are treated or removed by licensed contractors.	24 hrs	7 days	28 days	Visual inspection	Inspection records showing compliance	100%
	10.5	Wetlands	Wetlands are managed in accordance with the permit requirements	24 hrs	7 days	28 days	Visual inspection, assessment of permit issuers	Instances of permit requirements not met	Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
11) REST AREAS AND PICNIC AREAS									
	11.1	Rest areas and picnic areas	i) Picnic areas are clean and neat in appearance.	24 hrs	28 days	6 months	Inspection records showing compliance	Instances where 90% of measured area shall have grass and weeds height between 2 in. and 8 in.	100%
			ii) Trash barrels are painted and attached to their supports to prevent stealing.					Mowing shall begin before vegetation reaches 8 in.	100%
			iii) Site free of any visible litter, all litter properly disposed. Litter removed from the picnic area grounds and barrels before being allowed to accumulate outside of the barrels.	24 hrs	28 days	6 months		Number of bare ground areas larger than 5 square feet	Nil
			iv) All vehicles used in transporting litter are equipped to prevent the accumulated litter from being strewn along the roadway.					Number of prohibited, invasive or noxious weeds present.	Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	11.1 cont		v) Vegetation damaged due to improper or careless mowing and trimming operations or any other reason is replaced.					Occurrences of encroachment of vegetation or debris for more than two (2) inches onto any curb or sidewalk located throughout each rest area.	Nil
			vi) Weeds, grass and other undesirable growth are removed from beds of plants and shrubs as needed. Trees and shrubs are trimmed neatly. All curbs and sidewalks are edged and repaired.					Occurrences of deviation of soil or mulch above or below the top of the curb.	Nil
			vii) All picnic tables are clean, free of stains and free of any defect.					Paved surfaces maintained clean and safe with minimal obstruction.	100%
			viii) All directional, informational, safety and any other type of signage is properly installed, contains accurate information and is visible from a reasonable distance.					Occurrences of undermining greater than 2"	Nil
			ix) All striping is intact and all parking and travel areas are					Number of unsealed cracks > ½ inch.	Nil

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
			clearly marked. x) All curbs are in place and intact.					Number of lights fully functional.	100%
12) EARTHWORKS, EMBANKMENTS AND CUTTINGS									
	12.1	Slope Failure	All structural or natural failures of the embankment and cut slopes of the Facility are repaired	24 hrs	28 days	6 months	Visual inspection by geotechnical specialist and further tests as recommended by the specialist	Recorded instances of slope failure	Nil
	12.2	Slopes - General	Slopes are maintained in general conformance to the original graded cross-sections, the replacement of landscaping materials, reseeding and re-vegetation for erosion control purposes and removal and disposal of all eroded materials from the roadway and shoulders	24 hrs	28 days	6 months		Inspection records showing compliance	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
13) ITS and ETCS EQUIPMENT									
	13.1	ETCS Equipment – Maintenance	All ITS and ETCS equipment is fully functional and housing is functioning and free of defects. i) All equipment and cabinet identification numbers are visible, sites are well drained and access is clear. ii) Steps, handrails and accesses are kept in a good condition. iii) Access to all communication hubs, ground boxes, cabinets and sites is clear, iv) All drainage is operational and all external fixtures and fittings are in a satisfactory condition. v) All communications cable markers, cable joint markers and duct markers are visible and missing markers are replaced. vi) Backup power supply system is available at all times	24 hrs	14 days	1 month	Visual Inspection	Inspection records showing compliance	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Perma-nent Remedy	Cat 2 Perma-nent Repair			
	13.2	VES Equipment - Maintenance	All VES equipment is kept clean, the identification numbers are visible.	24 hrs	14 days	1 month	Visual Inspection	Inspection records showing compliance	100%
	13.3	Dynamic Message Sign Equipment	Dynamic Message Signs are free from faults such as: i) Any signal displaying an message which is deemed to be a safety hazard ii) Failure of system to clear sign settings when appropriate. iii) 2 or more contiguous sign failures that prevent control office setting strategic diversions iv) Signs displaying an incorrect message.	2 hrs	24 hrs	14 days	Defect measurement dependent on equipment	Inspection records showing compliance	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	13.4	CCTV Equipment	CCTV Systems are free from faults that limit the availability of the operators to monitor the area network, such as: i) Failure of CCTV Systems to provide control offices with access and control of CCTV images ii) Failure of a CCTV camera or its video transmission system. iii) Failure of a Pan / Tilt unit or its control system. iv) Moisture ingress onto CCTV camera lens v) Faults that result in significant degradation of CCTV images	2 hrs	24 hrs	14 days	Defect measurement dependent on equipment	Inspection records showing compliance	100%
	13.5	Vehicle Detection Equipment	All equipment free of defects and operational problems such as; i) Inoperable loops. ii) Malfunctioning camera controllers.	2 hrs	24 hrs	1 month	Defect measurement dependent on equipment Traffic Detector Loops: Loop circuit's inductance to be > 50 and < 1,000 micro henries. Insulation resistance to be > 50 meg ohms.	Inspection records showing compliance Instances of loops out of compliance	100% Nil
14) TOLLING Facilities and Buildings (Not Used)									

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
15) AMENITY									
	15.1	Graffiti	Graffiti is removed in a manner and using materials that restore the surface to a like appearance similar to adjoining surfaces	24 hrs	28 days	6 months	All graffiti is considered a Category 1 defect	Inspection records showing compliance	100%
16) SNOW AND ICE CONTROL									
	16.1	Travel lanes	Maintain travel way free from snow and ice	2hrs	N/A	N/A	Maximum 1hr response time to complete manning and loading of spreading vehicles Maximum 2hrs from departure from loading point to complete treatment and return to loading point Maximum 1hr response time for snow and ice clearance vehicles to depart from base	Inspection records showing compliance	100%
	16.2	Weather Forecasting	weather forecast information is obtained and assessed and appropriate precautionary treatment is carried out to prevent ice forming on the travel way	2hrs	N/A	N/A	Operations plan details the process and procedures in place and followed	Inspection records showing compliance	100%
	16.3	Operational Plans	Operate snow and ice clearance plans to maintain traffic flows during and after snowfall and restore the travel way to a clear condition as soon as possible.	2hrs	N/A	N/A	Operations plan details the process and procedures in place and followed	Inspection records showing compliance	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
17) INCIDENT RESPONSE									
	17.1	General	Respond to Incidents in accordance with Section 22.	1 hr	N/A	N/A	Response times met for 98% of incidents measured on a 1 year rolling basis. No complaints from Emergency Services.	Inspection records showing compliance	100%
	17.2	Hazardous Materials	For any hazardous materials spills, comply with the requirements of Section 22.	1 hr	N/A	N/A	FMP details the process and procedures in place and followed.	Inspection records showing compliance	100%
	17.3	Structural assessment	Evaluate structural damage to structures and liaise with emergency services to ensure safe working in clearing the incident	1 hr	N/A	N/A	Inspections and surveys as required by incident	Incident reports showing compliance	100%
	17.4	Temporary and permanent remedy	Propose and implement temporary measures or permanent repairs to Defects arising from the Incident. Ensure the structural safety of any structures affected by the incident	24hrs	28 days	N/A	Review and inspection of the incident site	Auditable inspection records showing compliance	100%
18) CUSTOMER RESPONSE									
	18.1	Response to inquiries	Timely and effective response to customer inquiries and complaints.	48 hrs	28 days	N/A	Contact the customer within 48 hours following initial customer inquiry.	Number of responses within specified times	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
	18.1 cont			48 hrs	28 days	N/A	All work resulting from customer requests is scheduled within 48 hours of customer contact. Follow-up contact with the customer within 72 hours of initial inquiry. All customer concerns/requests are resolved to TxDOT's satisfaction within 2 weeks of the initial inquiry.		
	18.2	Customer contact line	Telephone line manned during business hours and 24 hour availability of messaging system. Faults to telephone line or message system rectified	24 hrs	28 days	N/A	Instances of line out of action or unmanned	Operations records showing non availability including complaints from public.	nil
19) SWEEPING AND CLEANING									
	19.1	Sweeping	i) Keep all channels, hard shoulders, gore areas, ramps, intersections, islands and frontage roads swept clean, ii) Clear and remove debris from traffic lanes, hard shoulders, verges and central reservations, footways and cycle ways iii) Remove all sweepings	24 hrs	28 days	6 months	Buildup of dirt, ice rock, debris, etc. on roadways and bridges not to accumulate greater than 24" wide or 1/2" deep	Inspection records showing compliance	100%

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Performance and Measurement Table Baseline

ELEMENT CATEGORY	REF	ELEMENT	PERFORMANCE REQUIREMENT	RESPONSE TO DEFECTS			INSPECTION AND MEASUREMENT METHOD*	MEASUREMENT RECORD*	TARGET
				Cat 1 Hazard Mitigation	Cat 1 Permanent Remedy	Cat 2 Permanent Repair			
			without stockpiling in the right of way and dispose of at approved tip.						
	19.2	Litter	i) Keep the right of way in a neat condition, remove litter regularly ii) Pick up large litter items before mowing operations. iii) Dispose of all litter and debris collected at an approved solid waste site.	24 hrs	28 days	6 months	No more than 20 pieces of litter per roadside mile shall be visible when traveling at highway speed.	Inspection records showing compliance	100%

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20 BICYCLE AND PEDESTRIAN FACILITIES

20.1 General Requirements

This Section 20 includes requirements with which Developer shall design and construct all bicycle and pedestrian facilities for the Project. Developer shall ensure the bicycle and pedestrian facilities of this Project support TxDOT's commitment to integrate bicycle and pedestrian travel into Project development. Developer 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

Not used.

20.3 Design Requirements

20.3.1 Bicycle Facilities

Developer's facilities shall be consistent with the region's bicycle and pedestrian plan, comply with Environmental Approvals, and accommodate existing bicycle paths and crossings, and on-street bicycle facilities. Developer shall coordinate with Governmental Entities to ensure consistency with existing and proposed bicycle facilities.

20.3.2 Pedestrian Facilities

Developer 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* and Environmental Approvals. Developer 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.

Developer is responsible for obtaining Texas Department of Licensing and Regulation (TDLR) reviews and approvals of pedestrian facility design and construction.

20.3.3 Final Design

Developer shall incorporate into the Project Final Design the following elements relating to bicycle and pedestrian facilities:

- Alignment, profile, cross-section, and materials
- Points of connection to existing and proposed bicycle and pedestrian facilities
- Signing, signalization, and pavement markings
- Separation between bicycle or pedestrian facilities and the nearest travel lane
- Methods of illumination, where applicable
- Requirements of the Aesthetics and Landscaping Plan

20.4 Construction Requirements

Comply with Design Requirements.

20.5 Deliverables

Not used.

21 TOLLING

21.1 General Requirements

TxDOT will enter into a separate contract with the State-wide tolling integrator (hereinafter the "Integrator") to provide the Electronic Toll Collection System ("ETCS") for the Project. The Developer shall support the installation of the ETCS as described herein. Moreover, during the design phase of the Project, the Developer shall coordinate with TxDOT and the Integrator to finalize the design of all ETCS-related components.

21.2 Administrative Requirements

Not applicable.

21.3 Design Requirements

Not applicable.

21.3.1 ETCS Infrastructure Requirements

21.3.1.1 Mainline Tolling

Not applicable.

21.3.1.2 Ramp Tolling

Not applicable.

21.3.1.3 Utility and Personnel Access-way

Not applicable.

21.3.2 ETCS Functional Requirements

21.3.2.1 General

Not applicable.

21.3.2.2 User Classification Sub-system (UCS)

Not applicable.

21.3.2.3 Video Exception Sub-system (VES)

Not applicable.

21.3.3 ETCS Performance Requirements

Not applicable.

21.4 Construction Requirements

The Developer shall construct a toll zone maintenance area for each toll zone. *(See Figure 21.4-1)* The toll zone maintenance area shall include a paved parking area protected by concrete traffic barrier and any necessary crash attenuators. The overall length of the toll zone maintenance area shall be approximately 900 feet, of which approximately 700 feet shall be a weaving and stopping area for maintenance vehicles entering from the general purpose lanes. The Developer shall furnish and install four four-inch conduits extending from the toll zone maintenance area to edge of pavement outside of the general purpose lanes. The Developer shall furnish and install a ground box at each conduit terminus. The Developer shall coordinate with TxDOT and the Integrator to determine the exact dimensions of the toll zone maintenance area and the location of all conduits.

The Developer shall be responsible for all general roadway work through each tolling zone, *e.g.* paving, grading, striping, installation of traffic barriers, etc.

The Developer shall provide and install all static toll signs and sign support structures.

For clarification, the Integrator will be responsible for the following tasks:

The Integrator will furnish and install all toll gantries and toll gantry foundations. Generally, two gantries will be installed at each toll zone. The toll gantry foundations will not be in-line with any Developer-installed concrete traffic barrier.

The Integrator will furnish and install all Dynamic Message Signs ("DMS") responsible for displaying toll amounts, *i.e.* DMS not used for general ITS purposes. The Integrator will also be responsible for installing sign structures, power, and communications for each toll DMS.

The Integrator will be responsible for coordinating with the communications and electrical Utility Owners to purchase and install the service on behalf of TxDOT.

The Integrator will install all toll-gantry-mounted static signs.

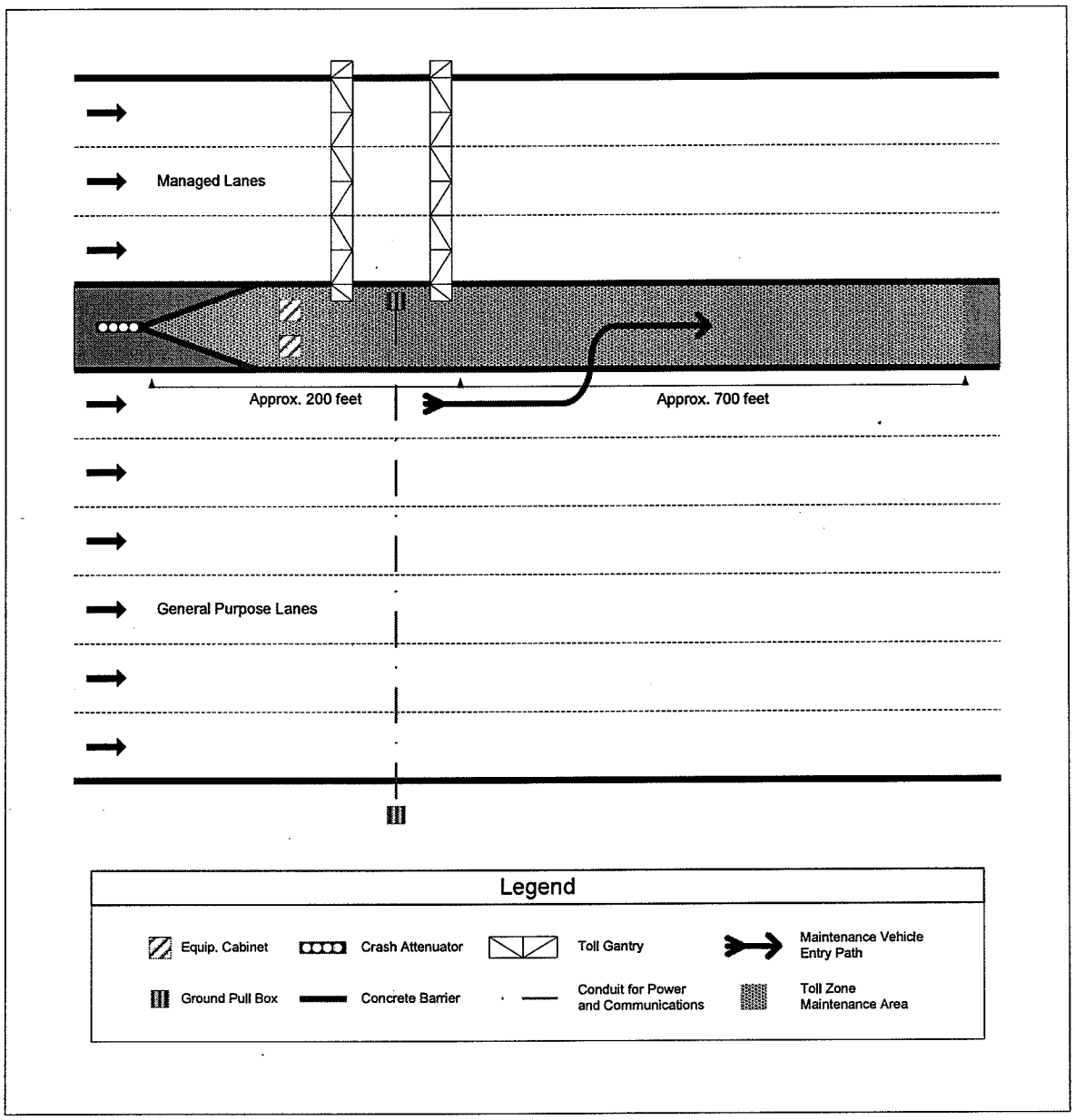

Figure 21.4-1 - Toll Zone Maintenance Area

21.5 Deliverables

Not applicable.