EXHIBIT 2

MAINTENANCE SPECIFICATION

(Attached)

0100 GENERAL

0101 General requirements

A. Maintenance Contractor shall be responsible for and shall carry out Maintenance Services for the Maintained Elements set forth in Exhibit 2, Attachment 2 throughout the Maintenance Term such that each Maintained Element set forth in Exhibit 2, Attachment 2 shall comply with the Performance Requirements set forth in Attachment 1 to this Maintenance Specification.

B. In carrying out the Maintenance Services, Maintenance Contractor shall take into account and comply with the requirements of this Maintenance Specification.

C. The limits for Maintenance Services are set forth in Attachment 3 to this Maintenance Specification.

0200 PROJECT MANAGEMENT

0201 General Requirements

A. Maintenance Contractor shall establish and maintain an organization that effectively manages all the Maintenance Services. This Project management effort will be defined and guided by the Maintenance Management Plan. The Maintenance Management Plan is an umbrella document that describes the Maintenance Contractor's managerial approach, strategy, and quality procedures to maintain the Project and achieve all requirements of the CMA Documents. Unless otherwise agreed by Texas Department of Transportation (TxDOT), the Maintenance Management Plan shall be consistent with the capital maintenance plan submitted with the Proposal.

B. TXDOT will audit and monitor the activities described in the Maintenance Management Plan to assess Maintenance Contractor performance. All statements contained in the Maintenance Management Plan shall be of an auditable nature, as described in Section 19.2 of the Technical Provisions.

0202 Project Schedule

A. The Parties recognize the importance of the Project Schedule for defining the time-frame for the maintenance of the Project and the achievement of the milestones. The Parties also recognize the importance of the Project Schedule in monitoring the progress of Maintenance Services of the Project and denoting changes that occur.

B. Every submitted schedule shall be in the form of a single hard copy in full-size color plot sheets, along with a backup disk of the schedule in electronic format.

C. The scheduling software employed by the Maintenance Contractor shall be compatible with the scheduling software employed by TxDOT. Maintenance Contractor shall implement any new operating practices or software required as a result of TxDOT's amendments to any such systems, standards and procedures. TxDOT's current software in use is Primavera 6.0 (P6). "compatible", as used in this Section 0202C, shall mean that the Maintenance Contractor-provided electronic file version of the Project Schedule may be loaded or imported by TXDOT using its scheduling software with no modifications, preparation or adjustments. Maintenance Contractor shall be responsible for updating scheduling software to maintain compatibility with current TXDOT supported scheduling software.

D. Maintenance Contractor shall prepare a Maintenance Services Deliverables Schedule and shall submit it to TXDOT for review and approval. Approval of the Maintenance Services Deliverables Schedule shall be a condition precedent to commencing Maintenance Services.

E. The Maintenance Services Deliverables Schedule shall refer to the activities within the Maintenance Management Plan which will provide a narrative describing, in general fashion,

the Maintenance Contractor's proposed methods of operation for Maintenance Services. The Maintenance Management Plan shall address the general sequence of Maintenance Services and all Schedule deadlines.

F. The Maintenance Services Deliverables Schedule shall include all major activities of Maintenance Services required under the CMA Documents, in sufficient detail to monitor and evaluate progress, during the Maintenance Period(s).

G. The Maintenance Services Deliverables Schedule shall include activities for maintenance and interfaces with other projects, localities, municipalities and other Governmental Entities.

H. For each activity, Maintenance Contractor shall indicate the duration (in Days) required to perform the activity and the anticipated beginning and completion date of each activity. In addition, the Maintenance Services Deliverables Schedule shall indicate the sequence of performing each activity and the logical dependencies and inter-relationships among the activities.

I. The Maintenance Services Deliverables Schedule shall include a listing of all submittals as called out in the CMA Documents. Submittal activity durations shall include specific durations for TXDOT review and/or approval of the Maintenance Contractor's submittals as called out elsewhere in the CMA Documents.

J. With the exception of activities relating to Environmental Approvals by Governmental Entities, each activity depicting the Maintenance Contractor's operations shall have duration of not more than 20 Days, and not less than one Day, except as otherwise approved by TxDOT.

K. Maintenance Contractor shall update or provide a notification of no change to the current schedule, on at least a monthly basis, the approved Maintenance Services Deliverables Schedule to reflect the current status of the Project, including approved Change Orders.

L. Each Maintenance Services Deliverables Schedule update shall accurately reflect all activities as of the Effective Date of the updated schedule.

M. The Maintenance Services Deliverables Schedule updates shall include a schedule narrative report which describes the status of the Maintenance Services in detail.

N. On or before 60 days after the issuance of Maintenance NTP1, Maintenance Contractor shall submit the first Capital Asset Replacement Work Submittal (forming part of the Maintenance Management Plan) for TXDOT for review as further described in Section 1903.

O. This section O is not applicable for the Maintenance Services Deliverables Schedule but shall be utilized for the Capital Asset Replacement Work Schedule. Float shall not be considered as time for the exclusive use of or benefit of either TxDOT or the Maintenance Contractor

but shall be considered as a jointly owned, expiring resource available to the Project and shall not be used to the financial detriment of either Party. Any method utilized to sequester Float calculations will be prohibited without prior approval of TxDOT. Any schedule, including the Capital Asset Replacement Work and all updates thereto, showing an early completion date shall show the time between the scheduled completion date and the applicable deadline as "Project Float."

0203 Maintenance Document Management Plan

A. Maintenance Contractor shall establish and maintain an electronic document control system ("Maintenance Document Management Plan") to store, catalog, and retrieve all Project-related documents in a format compatible with Texas Reference Marker System used by TxDOT. Unless otherwise directed by TxDOT, record retention shall comply with the requirements of the Texas State Records Retention Schedule.

B. All records and the then-current electronic document control system shall be provided to TXDOT at the time of the expiration or earlier termination of the CMA.

0204 Maintenance Services Quality Control Plan

A. Maintenance Contractor shall submit a comprehensive quality control plan ("Maintenance Services Quality Control Plan') to TXDOT for approval that is consistent with and expands upon the preliminary Maintenance Services Quality Control Plan submitted with the Proposal.

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

C. The Maintenance Services Quality Control Plan shall describe the system, policies, and procedures that address the Maintenance Services and provide documented evidence that the Maintenance Services were performed in accordance with the CMA Documents.

D. The Maintenance Services Quality Control Plan shall incorporate the following features:

- Maintenance Contractor shall make all quality records immediately available to TXDOT for review. Maintenance Contractor shall provide TXDOT with a copy of any and/or all quality records when requested.
- The Maintenance Services Quality Control Plan shall capture all work performed by the Maintenance Contractor and all Subcontractors.
- Maintenance Contractor shall submit to TXDOT the results of all internal audits within seven Days of their completion,
- Maintenance Contractor shall submit to TXDOT non-conformance reports within seven Days their issuance and resolution. Maintenance Contractor shall notify

TXDOT of a Nonconforming Work within two Days of discovering the Nonconforming Work.

- TXDOT will issue a non-conformance report if TXDOT discovers any Nonconforming Work.

E. The Maintenance Services Quality Control Plan shall contain detailed procedures for all activities performed by the Maintenance Contractor. Maintenance Contractor's quality process shall incorporate planned and systematic activities. Maintenance Contractor shall conduct all activities in accordance with the Maintenance Services Quality Control Plan and the requirements of the CMA Documents.

F. 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".)

G. Quality terminology, unless defined or modified elsewhere in the CMA Documents, shall have the meaning defined in BS ISO 9001. Terms used in BS ISO 9001 shall have the meanings defined below:
   - Organization: the Maintenance Contractor's organization, including any Affiliates and Subcontractors.
   - Customers: the Users of the roadways, TxDOT, Customer Groups, and key stakeholders that have an adjacent property interest or connecting roadway.
   - Suppliers: Contractors.
   - Product: Maintenance Services.
   - Quality control: the part of quality management focused on fulfilling quality requirements.
   - Quality Management Plan: the Maintenance Services Quality Control Plan described in this Section 0204.

H. Maintenance Contractor shall maintain the Maintenance Services Quality Control 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 activities.
   - Identification of testing agencies, including information on each agency's capability to provide the specific services required for the activities; certifications held; equipment; and location of laboratories.
   - Resumes for all quality management personnel.

I. The Maintenance Services Quality Control Plan shall contain a complete description of the quality policies and objectives that the Maintenance Contractor will implement throughout its organization. The policies shall demonstrate the Maintenance Contractor senior management's commitment to implement and continually improve the maintenance quality management system.

J. The Maintenance Services Quality Control Plan shall contain detailed systems and procedures the Maintenance Contractor will implement, including the following:
- Control of quality records;
- Management reviews;
- Resource allocation;
- Measurement of customer satisfaction;
- Control of nonconforming products and services;
- Internal audits;
- A process to seek continual improvement of the Maintenance Services Quality Control Plan.

K. The Maintenance Services Quality Control Plan shall contain detailed descriptions of the inspection and test plans, including the timing and frequency of testing, that the Maintenance Contractor will use to meet quality control requirements of the Maintenance Services.

L. Maintenance Contractor shall revise its Maintenance Services Quality Control Plan when its own quality management organization detects a repeating or fundamental non-conformance in the work performed or in the manner the Maintenance Services are inspected or tested, or when TXDOT advises the Maintenance Contractor of such a problem.

M. Maintenance Contractor's Maintenance QC Manager staff shall have no responsibilities in the provision of Maintenance Services. Quality control staff shall only have responsibilities on the provision of Maintenance Services.

N. Maintenance Contractor's Maintenance QC Manager shall report directly to the Maintenance Contractor's principals.

O. The Maintenance QC Manager shall prepare a monthly report of the quality inspections and tests performed, results of such inspections and tests, and occurrences and resolution of nonconformance discoveries. Maintenance Contractor shall submit the monthly reports to TXDOT for review.

P. Maintenance Contractor's QC Manager shall have the authority to stop work for quality-related issues.

Q. Not later than two Business Days after the Maintenance Contractor completes design of any particular Released for Construction Documents, and the Maintenance Contractor has

reviewed and checked the design in accordance with the Maintenance Services Quality Control Plan, and the Maintenance Contractor's Registered Professional Engineer has signed and sealed the document, the Maintenance Contractor shall submit the signed and sealed document to TxDOT. Maintenance Contractor's Released for Construction Documents shall comply with the CMA Documents, and shall be detailed, complete, constructible, and shall allow verification of the design criteria and compliance with CMA Documents.

R. Maintenance Contractor shall perform Maintenance Services 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 CMA Documents.

S. On or about the Effective Date of termination of Maintenance Services, the Maintenance Contractor shall submit to TXDOT a complete set of Record Drawings. The Record Drawings and Documentation shall be an organized, complete record of drawings and supporting calculations and details that accurately represent what the Maintenance Contractor constructed.

T. Maintenance Contractor shall ensure that the Record Drawings reflect the actual condition of the Maintenance Services construction.

U. The Maintenance Services Quality Control Plan shall contain detailed procedures for the Maintenance Contractor's quality control activities. Maintenance Contractor's construction or maintenance operations must incorporate quality processes as part of its Quality Management Plan, including planned and systematic activities undertaken by a party independent of the construction or maintenance process. Maintenance Contractor is to undertake all quality control in accordance with the Quality Management Plan and the requirements set out in the CMA Documents.

0205 Maintenance Safety Plan

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

B. Maintenance Contractor shall submit to TXDOT for approval a comprehensive safety plan ("Maintenance Safety Plan") that is consistent with and expands upon the preliminary safety plan submitted with the Proposal. The Maintenance Safety Plan shall fully describe the Maintenance Contractor's policies, plans, training programs, work site controls, and Incident Management Plans to ensure the health and safety of personnel involved in the Project and the general public affected by the Project during the Maintenance Term.

C. Maintenance Contractor's Maintenance Safety Plan shall address procedures for immediately notifying TXDOT of all Incidents arising out of or in connection with the performance of the Maintenance Services, whether on or adjacent to the Project.

0206 Management of Communications between Maintenance Contractor and TxDOT

A. Maintenance Contractor shall submit a comprehensive communications plan ("Maintenance Communications Plan") to TXDOT for approval that is consistent with and expands upon the preliminary communications plan submitted with the Proposal. Maintenance Contractor shall maintain and update the Maintenance Communications Plan as the Maintenance Term progresses.

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

C. The Maintenance Communications Plan shall describe how the Maintenance Contractor's organization will respond to unexpected requests for information, communicate changes or revisions to necessary Maintenance Contractor personnel, and notify TXDOT before and after changes are made to the CMA Documents.

0207 Design

A. In carrying out the Maintenance Services, where there is a requirement for design, the Maintenance Contractor shall ensure that the Project is restored either to the original design used for the construction of the Project, or to a different design that shall be in accordance with the requirements for design set forth in the Contract Documents.

B. TxDOT shall retain the approval of certain documents as described in Section 3.0 of the Development Agreement

0208 Maintenance Transition

A. Maintenance Contractor shall submit the Maintenance Transition Plan within the time period specified in Section 3.6.1 of the CMA Document. As a minimum, the Maintenance Transition Plan shall address the following items.

- Prepare and submit to the TxDOT, for TXDOT approval, a right of entry permit for access to the Project for performance of corrective action regarding the condition of the Project immediately prior to transfer.
- Prepare and submit Maintenance Transition punch list, list and status of equipment Warranties, vendors' test reports, Maintenance Contractor's test reports, all as-built drawings for Capital Asset Replacement Work, Maintenance Records (including NBIS records), copies of Warranty and service contracts, and spare parts purchased as part of the Maintenance Services.
- Coordinate the identification of Maintenance Transition punch list items required to be completed by Maintenance Contractor prior to maintenance transfer. Maintenance

Transition punch list shall include (a) estimated completion dates, (b) responsible Party(s), and (c) items that must be completed prior to maintenance transfer.

- Prepare (in conjunction with TxDOT), administer and complete all items on the maintenance transfer punch list to the satisfaction of the TxDOT. Maintenance Contractor shall complete all items on the Maintenance Transition punch list to the satisfaction of the TXDOT prior to the transfer of maintenance responsibilities to TxDOT.
- Certify to TXDOT in writing that the Project can be safely used for its intended purpose and that the Maintenance Services have been performed in accordance with the terms of the CMA Documents, Governmental Approvals and applicable Law.
- Certify to TXDOT in writing that there are no Hazardous Materials located within, on, in or under the Project ROW due to the actions, omissions, negligence, willful Misconduct, or breach of applicable Law or contract by the Maintenance Contractor or any Major Subcontractors.
- Certify to TXDOT in writing that there is no litigation pending regarding the Maintenance Services or the Project by the Maintenance Contractor or any Major Subcontractors.

0300 PUBLIC INFORMATION AND COMMUNICATIONS

0301 General Requirements

A. It is vital to the success of the Project that TXDOT and the Maintenance Contractor gain and maintain public support. The public will better support TXDOT and the Maintenance Contractor 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 the Maintenance Contractor, and perceive a high quality, well executed communications plan for keeping them informed, engaged, and educated.

B. Maintenance Contractor shall provide information within 24 hours of a request by TxDOT, such that TXDOT may communicate such information to interested parties.

0302 Public Information and Communications Plan

Not used.

0303 Public Information Coordinator

Not used.

0304 Public Information Office

Not used.

0305 Customer Groups

Not used.

0306 Public Meetings

Not used.

0307 Meeting Minutes

Not used.

0308 Emergency Event Communications

Not used.

0309 Disseminating Public Information

Not used.

0400 ENVIRONMENTAL

It is not envisioned that there will be any requirement for environmental permitting, mitigation, or Hazardous Material remediation caused by Maintenance Services. Environmental permitting, mitigation, and Hazardous Material remediation required due to reconstruction etc., shall be dealt with in accordance with appropriate sections of the Development Agreement.

0500 THIRD PARTY AGREEMENTS

It is not envisioned that there will be any impact on third party agreements by Maintenance Services. If there is any such impact, for example due to extension or reconstruction works, these shall be dealt with in accordance with appropriate sections of the Development Agreement.

0600 UTILITY ADJUSTMENTS

It is not envisioned that there will be any requirement for Utility Adjustments caused by Maintenance Services. Utility Adjustments required due to reconstruction etc., shall be dealt with in accordance with appropriate sections of the Development Agreement.

0700 RIGHT OF WAY (ROW)

It is not envisioned that there will be any ROW requirements for Maintenance Services. ROW requirements due to reconstruction etc., shall be dealt with in accordance with appropriate sections of the Development Agreement.

0800 GEOTECHNICAL

It is not envisioned that there will be any geotechnical requirements for Maintenance Services. Geotechnical requirements due to reconstruction etc shall be dealt with in accordance with appropriate sections of the Development Agreement.

0900 LAND SURVEYING

It is not envisioned that there will be any land surveying requirements for Maintenance Services. Land surveying requirements due to reconstruction etc., shall be dealt with in accordance with appropriate sections of the Development Agreement.

1000 GRADING

Grading requirements shall be in accordance with Attachment 1 (Table 19-1) and Attachment 2 to CMA Exhibit 2. Grading requirements due to reconstruction etc., shall be dealt with in accordance with appropriate sections of the Development Agreement.

1100 ROADWAYS

Roadways shall be maintained in accordance with Attachment 1 (Table 19-1) and Attachment 2 to Exhibit 2. Roadway requirements required due to reconstruction etc., shall be dealt with in accordance with appropriate sections of the Development Agreement.

1200 DRAINAGE

1201 General requirements

TXDOT will maintain the drainage elements according to the applicable TxDOT maintenance guidelines, standards and specifications.

1202 Data collection

Not used.

1203 Coordination with other agencies

Not used.

1204 Other Requirements

Not used.

1300 STRUCTURES

General: Maintenance of all structures shall be in accordance with Attachment 1 (Table 19-1) and Attachment 2 to Exhibit 2. Structures requirements required due to reconstruction etc., shall be dealt with in accordance with appropriate sections of the Development Agreement.

1400 RAIL

1401 Project work affecting railroad operations

A. Should the Project cross a railroad right of way owned by an operating railroad, Maintenance Contractor shall coordinate the Maintenance Services with the operating railroad.

B. Maintenance Contractor shall be responsible for obtaining the required approvals, permits, and agreements as required for the Maintenance Services, including any railroad related Maintenance Services.

C. Whenever an agreement for construction, maintenance and use of railroad right-of-way between the operating railroad and TxDOT is required, Maintenance Contractor shall prepare all the documentation required to obtain the agreement, including preparation of the agreement application on behalf of TxDOT, the drawings and specifications, making necessary modifications as required, and preparation of the agreement. Maintenance Contractor shall submit the draft agreement to TxDOT for transmittal to the operating railroad. After all comments have been incorporated or satisfactorily resolved by Maintenance Contractor, railroad or TxDOT, Maintenance Contractor shall submit a complete and final agreement to TxDOT for execution.

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

E. Maintenance Contractor shall cooperate and coordinate with all operating railroads for access by the operating railroad and/or their agents to the rail right-of-way as necessary for rail maintenance and operations activities.

F. Maintenance Contractor shall procure and maintain, prior to working adjacent to and entry upon operating railroad property, insurance policies naming TxDOT, TxDOT's Consultants, and railroad as named insured. Maintenance Contractor shall obtain insurance per Exhibit 10 of the CMA Documents.

G. 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 the Maintenance Contractor upon operating railroad property.

1402 Construction Requirements

A. Maintenance Contractor shall comply with all construction requirements and specifications set forth by the operating railroad.

B. Maintenance Contractor 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. Maintenance Contractor shall be responsible for all costs associated with the railroad/transit force account work.

1500 AESTHETICS AND LANDSCAPING

1501 Project work affecting aesthetics and landscaping

A. Maintenance Contractor shall repair all structural or natural failures of the embankment and cut slopes of the Project throughout the term of this CMA. Such work shall include all work required to maintain the slopes 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. TxDOT and Maintenance Contractor acknowledge that plant establishment requirements and obligations are not included within the Maintenance Services, but are part of the Developer's obligations under the Development Agreement for a period of 3 years after the date of Final Acceptance of a Segment. However, if a structural or natural failure of the embankment or cut slope occurs in a landscaped area after the 3 year time period expires, the Maintenance Contractor shall be responsible to perform plant establishment activities for 90 calendar days in accordance with Item 192 (Landscape Planting) and Item 193 (Landscape Establishment) of the 2004 TxDOT Standard Specifications for Construction of Highways, Streets, and Bridges.

1600 SIGNING, DELINEATION, PAVEMENT MARKING, SIGNALIZATION, AND LIGHTING

1601 Administrative Requirements

Not used.

1602 Third Party Signs

Not used.

1603 Construction requirements

A. Maintenance Contractor shall leave all applicable advance guide signs and/or exit direction signs in place at all times and shall not obstruct the view of the signs to the Users. Maintenance Contractor shall replace any other removed signs before the end of the work day.

1604 Other requirements

A. Signing, delineation, pavement marking, signalization, and lighting requirements due to reconstruction etc. shall be dealt with in accordance with appropriate sections of the Development Agreement .

1700 INTELLIGENT TRANSPORTATION SYSTEMS

It is not envisioned that there will be any intelligent transportation system requirements for Maintenance Services. Intelligent transportation system requirements due to reconstruction etc., shall be dealt with in accordance with appropriate sections of the Development Agreement.

1800 TRAFFIC MANANGEMENT

1801 General Requirements

A. Throughout the Maintenance Term, Maintenance Contractor shall conform with the requirements set forth in this Series 1800, and shall 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.

B. While planning and carrying out Maintenance Services, Maintenance Contractor shall take into account the restrictions (if any) set forth in Attachment 6 to this Maintenance Specification.

1802 Administrative Requirements

A. As a component of the Maintenance Management Plan, Maintenance Contractor shall develop, implement, and maintain a Traffic Management Plan (TMP) to be used during the Maintenance Term. At a minimum, the TMP shall include the following:
   (i) Descriptions of the qualifications and duties of the traffic engineering manager, traffic control coordinator, and other personnel with traffic control responsibilities
   (ii) 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
   (iii) Procedures for obtaining acceptance of detours, road and Lance Closures and other traffic pattern modifications from applicable Governmental Entities, stakeholders, operators of the managed lane facilities and adjacent sections of roads and adjacent landowners, and implementing, maintaining and removing those modifications
   (iv) Procedures for installation, maintenance and removal of interim signing and the corresponding handling of permanent signing during maintenance operations
   (v) Procedures for installation, maintenance, replacement and removal of traffic control devices, including pavement markings and traffic barriers, if used
   (vi) Procedures and process for the safe ingress and egress of construction vehicles in the work zone
   (vii) 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
   (viii) Procedures to modify plans as needed to adapt to changing Project circumstances

(ix) Procedures to communicate TMP information to Maintenance Contractor's public information personnel and notify the public of maintenance of traffic issues

(x) Descriptions of contact methods, personnel available, and response times for any Emergency conditions requiring TXDOT attention during off-hours.

1803 Design Requirements

A. Maintenance Contractor shall use the procedures in the TMP and the standards of the TMUTCD to develop detailed traffic control plans that provide for all Maintenance Services, as well as all required switching procedures. The traffic control plans shall include details for all detours, traffic control devices, striping, and signage applicable to each Maintenance Activity event. 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.

B. Maintenance Contractor shall ensure that opposing traffic on a normally divided roadway shall be separated with appropriate traffic control devices.

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

D. Maintenance Contractor shall ensure all streets and intersections remain open to traffic to the greatest extent possible. Maintenance Contractor shall maintain access to all adjacent streets and shall provide for ingress and egress to public and private properties at all times.

1804 Construction Requirements

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

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

C. Maintenance Contractor shall provide TXDOT the names of the traffic control coordinator and support personnel, and the phone number(s) where they can be reached 24 hours per day, seven days per week.

D. Maintenance Contractor shall maintain existing bicycle and pedestrian access and mobility with the frontage roads and across all cross streets. Maintenance Contractor shall maintain Access to existing transit stop locations during construction or reasonable alternative locations shall be provided.

E. Maintenance Contractor shall maintain all detours in a safe and traversable condition. Maintenance Contractor shall provide a pavement transition at all detour interfaces, suitable for the posted speed of the section.

1805 Deliverables

A. The TMP must be approved by TXDOT prior to the start of Maintenance Services. Maintenance Contractor shall provide TxDOT sufficient time for review of, and comment on, the TMP. TXDOT retains the right to require revision and re-submittal of the TMP within a reasonable amount of time.

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

1900 MAINTENANCE

1901 General Maintenance Requirements

A. Maintenance Contractor shall remedy and repair the Maintained Elements including renewal or rehabilitation work not scheduled in the Maintenance Contractor's annually recurring highway maintenance and repair program.

B. Maintenance Contractor shall perform Capital Asset Replacement Work:

(i) when required by Maintenance Contractor's approved Maintenance Management Plan and updates thereto; or

(ii) when a Performance Requirement is not met and the required level of performance cannot be achieved by means of routine or preventive maintenance.

C. TXDOT retains maintenance responsibilities for Non-maintained Elements and TXDOT will maintain the Non-maintained Elements according to the applicable TxDOT maintenance guidelines, standards and specifications. Third parties, such as Utilities and the Systems Integrator may require access to the Project to perform maintenance or other work. In addition to the requirements for traffic management set forth in Series 1800, Maintenance Contractor shall coordinate its Traffic Management Plan with the traffic management to be performed by others, to minimize disruption to Users of the Project

D. Whenever an activity by Maintenance Contractor disturbs, alters, removes or changes any Non-maintained Element, Maintenance Contractor shall restore the affected Non-maintained Element to a condition no less favorable than its original condition before it was disturbed, altered, removed or changed.

E. Whenever Maintenance Contractor becomes aware of any Defect in any Maintained Element that Maintenance Contractor considers Maintenance Contractor is not required to repair, or any maintenance activity that Maintenance Contractor considers should be performed, but which Maintenance Contractor considers Maintenance Contractor is not required to perform as part of the Maintenance Services, Maintenance Contractor shall immediately notify TxDOT of the nature of the Defect or maintenance activity and relevant details that will facilitate repair or action by TxDOT.

1902 General Maintenance Obligations

A. Maintenance Contractor shall take all necessary actions to achieve the following:

(i) Maintain the Maintained Elements in a manner appropriate for a facility of the character of the Project.

(ii) Minimize delay and inconvenience to Users and, to the extent Maintenance Contractor is able to control, Users of adjacent and connecting roadways.

(iii) Minimize the risk of damage, disturbance, or destruction of third-party property during the performance of Maintenance Services.

(iv) Coordinate with and enable TXDOT and others with statutory duties or functions in relation to the Project to perform such duties and functions.

(v) Perform systematic Project inspections, periodic maintenance, and routine maintenance in accordance with the provisions of Maintenance Contractor's Maintenance Management Plan and Maintenance Contractor's Maintenance Safety Plan and the CMA Documents.

B. Maintenance Contractor is responsible for providing all resources necessary for the performance of all Maintenance Services, in the Maintenance Management Plan and as required by the CMA Documents.

C. Maintenance Contractor shall comply with the requirements of Series 1800 – Traffic Management

D. All Lanes shall be maintained in accordance with the same standard of maintenance.

E. For Category 1 Defects, the Maintenance Contractor shall take necessary action such that the hazard to Users is mitigated within the period given in the column entitled "Category 1 Hazard Mitigation" in Attachment 1 to this Maintenance Specification, and shall permanently remedy the Category 1 Defect within the period given in the column entitled "Category 1 Permanent Remedy" in Attachment 1 to this Maintenance Specification.

F. For Category 2 Defects, the Maintenance Contractor shall undertake the permanent repair within the period specified in the column entitled "Category 2 Permanent Repair" in Attachment 1 to this Maintenance Specification.

G. The Maintenance Contractor shall coordinate with TXDOT to achieve a smooth transition of Maintenance Services from and to TxDOT.

1903 Maintenance Management Plan (MMP)

A. Maintenance Contractor shall prepare a Maintenance Management Plan (MMP) that is consistent with the general maintenance obligations described in Section 1902 (General Maintenance Obligations) and defines the process and procedures for the maintenance of the Project throughout the Maintenance Term. 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 Maintained Element of the Project in accordance with Attachment 1 to this Maintenance Specification, including impacts to adjacent and connecting roadways. The MMP shall identify response times to mitigate hazards, permanently remedy, and permanently repair Defects. Response times shall be in accordance with the Attachment 1 to this Maintenance Specification. Maintenance Contractor shall update this plan as required, or at least annually.

B. The MMP shall include procedures for managing records of inspection and Maintenance Services, including appropriate measures for providing protected duplication of the records. Inspection and Maintenance Records shall be kept for the Maintenance Term and shall be provided to TXDOT at the time the Project is delivered to TxDOT, at either the expiration of the Maintenance Term or earlier termination of the Agreement. All records obtained during the Warranty Periods shall be kept and provided to TxDOT at the end of the last Warranty Period.

C. Maintenance Contractor shall submit the MMP to TXDOT for review and approval no later than 60 Days following the issuance of NTP1. Approval by TXDOT of the MMP shall be a condition precedent to the performance of Maintenance Services.

D. To the extent that Maintenance Contractor proposes any enhancements to the Performance Requirements set forth in Attachment 1 to this Maintenance Specification, Maintenance Contractor's MMP shall include Performance Requirements, measurement procedures, and threshold values at which maintenance is required for each Maintained Element of the Project in accordance with Section 1908 of this Maintenance Specification, including impacts to Adjacent Work or facilities. Inspection procedures and frequencies, and subsequent maintenance to address noted deficiencies of the Maintained Elements shall also be included, in accordance with the requirements of Section 1909 of this Maintenance Specification. The MMP shall identify response times to mitigate hazards, permanently remedy, and permanently repair Defects, which shall, at a minimum, be in accordance with Attachment 1 to this Maintenance Specification. Maintenance Contractor shall update this plan as required, or at least annually.

E. The MMP shall include Maintenance Contractor's proposals for Capital Asset Replacement Work, as set forth in Section 3.2 of the Agreement and as further described below. The Capital Asset Replacement Work Submittal (which is to be a component of the MMP) shall include the timing, scope and nature of work that Maintenance Contractor proposes during each year for which the Maintenance Services are to apply. Maintenance Contractor shall set forth, by Maintained Element:

    (i) the estimated Useful Life;

    (ii) a description of the type of Capital Asset Replacement Work anticipated to be performed at the end of the Maintained Element's Useful Life;

    (iii) a brief description of any Capital Asset Replacement Work anticipated to be performed before the end of the Maintained Element's Useful Life, including reasons why this work should be performed at the proposed time; and

    (iv) a Capital Asset Replacement Work Schedule as described in Section 0202 (Project Schedule) of this document.

F. Maintenance Contractor shall prepare updates to the Capital Asset Replacement Work requirements of the MMP as set forth in Section 3.2 of the Agreement.

G. The MMP shall include a schematic clearly illustrating the limits, using auditable sections per section 1906, of the maintenance services as described in attachment 3 of this exhibit.

1904 Maintenance During Work

See applicable area of Development Agreement.

1905 Highway Location and Data Requirements

A. Maintenance Contractor shall implement the Texas Reference Marker System.

1906 Auditable Sections

A. Maintenance Contractor shall establish Auditable Sections referenced to the Texas Reference Marker System used by TXDOT. Maintenance Contractor shall prepare drawings identifying the Auditable Sections and shall submit to TXDOT for approval as a condition precedent to commencing Maintenance Services. The drawings shall identify the boundaries of each Auditable Section and shall cross reference to an inventory describing each Maintained Element of the Project contained within each Auditable Section.

1907 Maintenance Management Information System

A. Maintenance Contractor shall implement a computer based Maintenance Management Information System (MMIS), in accordance with TxDOT MMIS User Manual, to record inventory, failures, repairs, maintenance activities and inspections performed.

B. The MMIS shall include relevant Maintained Element information including but not limited to, location to the nearest tenth mile, using the posted reference marker number, Geographic Information System (GIS) data and control number for bridge class structures, asset description, date of installation, type of failure, date-time of failure, date-time of response to the site and date-time returned to service, preventive maintenance work, scheduled work, work repair code, time of failure, to time of repair. The MMIS shall be configured to report work by TxDOT "function code", Maintained Element, reference marker, and unit of measurement, as the same described in the aforementioned MMIS User Manual, to categorize the Maintenance Services performed by the Maintenance Contractor.

C. The MMIS system shall be able to record all complaints/service requests. The Maintenance Contractor shall be able to report weekly to the TxDOT, on a format approved by TxDOT, information on any complaints or service requests received by the Maintenance Contractor. This information will include the following:

(i) The date and time of the complaint;

(ii) The location and nature of the problem;

(iii) Injuries and police involvement, including agency, name and badge number;

(iv) Who made the complaint; and

(v) Date and action taken to address the complaint

D. The MMIS system shall be able to record all accidents/Incidents, as described herein. The Maintenance Contractor shall be able to report in writing to the TxDOT, no later than the 15th of each calendar month on a format approved by the TxDOT, information from the previous month on any accident or Incident related to Maintenance Services being performed by Maintenance Contractor or within a work zone, including:

(i) accidents involving Maintenance Contractor or any Subcontractor personnel, equipment, barricades or tools;

(ii) traffic accidents within the limits or in the vicinity of any Maintenance Services being performed by Maintenance Contractor or any Subcontractors;

(iii) Releases of Hazardous Materials;

(iv) any accident involving Maintenance Contractor or the traveling public that causes damage to any Project appurtenance, structure, improvement or fixture.

(v) with respect to any accident/Incident, the information provided shall include as a minimum:

a. The date and time of the accident/Incident;
b. The location of the problem;
c. The nature of the problem;
d. All parties involved in the Incident, including names, addresses, telephone numbers and their involvement (including witnesses);
e. Responsible party and insurance information;
f. Action taken to address the Incident; and
g. Documentation of traffic control in place at location.

E. When a Maintained Element is constructed, installed, maintained, inspected, modified, replaced or removed, the MMIS shall be updated within three days of completion of such work. Defects shall be recorded on the MMIS within 3 days of them coming to the attention of Maintenance Contractor. All other recording requirements shall be recorded on the MMIS within 15 days of completion or occurrence of the relevant activity.

F. The MMIS shall be fully populated and operational prior to the commencement of Maintenance Services and kept updated and operational for the duration of the Maintenance Term. Maintenance Contractor shall provide equipment, facilities and training necessary to permit remote, real-time, dedicated high-speed access to the MMIS, via one terminal each, for TxDOT. Maintenance Contractor shall handover the MMIS and everything required for its operation to TxDOT, or other entity as directed by TxDOT, upon expiration or earlier termination of Maintenance Term.

G. In the event that TXDOT does not require Maintenance Contractor to provide a computer based Maintenance Management Information System, Maintenance Contractor shall provide TXDOT with all relevant Maintained Element information including but not limited to,

location to the nearest tenth mile, using the posted reference marker number, GIS data and control number for bridge class structures, asset description, date of installation, type of failure, date-time of failure, date-time of response to the site and date-time returned to service, preventive maintenance work, scheduled work, work repair code, time of failure, to time of repair. A report shall be available to summarize work by TxDOT "function code", Maintained Element, reference marker, and unit of measurement, as the same described in the aforementioned MMIS User Manual, to categorize the Maintenance Services performed by the Maintenance Contractor. When a Maintained Element is constructed, installed, maintained, inspected, modified, replaced or removed, the Maintenance Contractor shall provide TXDOT with all relevant information within three days of completion of such work. Maintenance Contractor shall provide all relevant information concerning Defects within 3 days of them coming to the attention of Maintenance Contractor. All other information requirements shall be provided to TXDOT within 15 days of completion or occurrence of the relevant activity.

1908 Performance Requirements

A. In the Maintenance Management Plan (MMP), Maintenance Contractor shall set forth annually, for TXDOT approval, a revised version of Attachment 1 to this Maintenance Specification that shall, except where indicated below, be consistent with Attachment 1 to this Maintenance Specification.

B. The first such submittal of the revised version of Attachment 1 to this Maintenance Specification shall be submitted for TXDOT approval as a condition precedent to the commencement of Maintenance Services The revised Attachment 1 to this Maintenance Specification shall set forth the following information:

Table 1908-1 – Attachment 1 Information Matrix

Heading in Attachment 1 to this Maintenance Specification	**Contents of Maintenance Contractor's submitted revised Attachment 1 to this Maintenance Specification**
Element	As Attachment 1 to this Maintenance Specification
Element Category	As Attachment 1 to this Maintenance Specification
Performance Requirements	As Attachment 1 to this Maintenance Specification
Response to Defects	As Attachment 1 to this Maintenance Specification
Inspection and measurement method	Subject to proposed amendment by Maintenance Contractor as part of annual submittal of MMP
Measurement record	Subject to proposed amendment by Maintenance Contractor as part of annual submittal of MMP
Target	As Attachment 1 to this Maintenance Specification

C. In its annual submittals of the revised Attachment 1 to this Maintenance Specification, Maintenance Contractor shall propose for TxDOT's approval such amendments to the

inspection and measurement methods and measurement records as are necessary to cause these to comply with this Maintenance Specification.

D. Within this Maintenance Specification, reference to the revised Attachment 1 to this Maintenance Specification means the latest approved version of the revised Attachment 1 to this Maintenance Specification as included within Maintenance Contractor's MMP.

E. Failure to meet a Performance Requirement, whether through failure to meet the Target for any relevant measurement record, or for any other reason, shall be deemed to be a Defect. Whenever a Defect is identified, either by Maintenance Contractor's inspections, by TXDOT or any third party, Maintenance Contractor shall act to remedy, repair and record the Defect as described in paragraphs F, G and H of this Section 1908.

F. The remedy or repair of any Maintained Element shall meet or exceed the standard identified in the column entitled "Target" in Attachment 1 to this Maintenance Specification and a Maintenance Record shall be created by Maintenance Contractor to verify that this requirement has been met.

G. The period for 'Response To Defects' set forth in Attachment 1 to this Maintenance Specification shall be deemed to commence upon the Maintenance Contractor becoming aware of the Defect.

H. Where action is taken to remedy or repair any Defect in any Maintained Element of the Project in accordance with this Section 1908, Maintenance Contractor shall create a Maintenance Record that identifies the nature of the remedy or repair. Maintenance Contractor shall include within the relevant Maintenance Record a measurement record compliant with the requirements set forth in the column entitled "Measurement Record" in the Attachment 1 to this Maintenance Specification.

1909 Inspections

A. Maintenance Contractor shall establish inspection procedures and plan and implement a program of inspections of the Project to be included within the Project Schedule that:

(i) verifies the continuing safety of the Project for Users;

(ii) prioritizes Category 1 Defects;

(iii) ensures that all Category 1 Defects are identified and repaired such that the hazard to Users is mitigated within the period given in the column entitled "Category 1 Hazard Mitigation" in Attachment 1 to this Maintenance Specification;

(iv) ensures that all Category 1 Defects are identified and permanently remedied within the period given in the column entitled "Category 1 Permanent Remedy" in Attachment 1 to this Maintenance Specification;

(v) identifies Category 2 Defects to be included for repair either within Maintenance Contractor's annually recurring highway maintenance and repair program or as Capital Asset Replacement Work;

(vi) ensures that all Category 2 Defects are identified and permanently repaired within the period given in the column entitled "Category 2 Permanent Repair" in Attachment 1 to this Maintenance Specification;

(vii) is responsive to reports or complaints received from Customer Groups;

(viii) takes account of Incidents and Emergencies affecting the Project;

(ix) monitors the effects of extreme weather conditions; and

(x) collates data to monitor performance of the Project and to establish priorities for future maintenance operations and Capital Asset Replacement Work.

B. Maintenance Contractor shall ensure that personnel performing inspections of road pavements and structures are certified as inspectors and/or raters in accordance with TxDOT's PMIS program or applicable certifying agency for the type of inspection being performed.

C. The periods stated in Attachment 1 to this Maintenance Specification under the headings of Category 1 Defects and Category 2 Defects shall be deemed to start upon the date Maintenance Contractor first obtained knowledge of, or first reasonably should have known of, the defect. For this purpose Maintenance Contractor shall be deemed to first obtain knowledge of the failure not later than the date of delivery of the initial notice to Maintenance Contractor. Maintenance Contractor shall investigate reports and complaints on the condition of the Project received from all sources. Maintenance Contractor shall record such reports and complaints as Maintenance Records together with details of all relevant inspections and actions taken in respect of Defects, including temporary protective measures and repairs.

D. In performing inspections to identify Category 1 and Category 2 Defects, Maintenance Contractor shall, for any Maintained Element, conform at a minimum to the inspection standards set forth for that Maintained Element in the column entitled "Inspection and Measurement Method" on Attachment 1 to this Maintenance Specification.

E. Maintenance Contractor shall perform General Inspections in accordance with the MMP so that: the repairs of all Defects are included in planned programs of work; and in any case in accordance with paragraph G of this Section 1909.

F. Maintenance Contractor shall record details of the manner of inspection (e.g. center Lance Closure or shoulder), the weather conditions and any other unusual features of the inspection, on O&M Records in respect of General Inspections.

G. Maintenance Contractor shall perform General Inspections such that Category 2 Defects are identified and repaired within the period shown in Attachment 1 to this Maintenance Specification or, if the Defect is not specified in Attachment 1 to this Maintenance Specification, within six months of the Defect occurring; provided that Defects which require special equipment to identify or are listed under the heading of Specialist Inspections in Table 1909-1 may have different identification periods.

H. Maintenance Contractor shall undertake Specialist Inspections for Maintained Elements listed in Table 1909-1 and shall include the inspection results as Maintenance Records.

Table 1909-1 – Specialist Inspections

Maintained Element	Specialist Inspection
All Maintained Elements in Element Category 'Roadway' in Attachment 1 to this Maintenance Specification	Annual survey of pavement condition for the entire Project, including main lanes, ramps, and frontage roads, undertaken using automated condition survey equipment to measure all necessary criteria including: ruts, skid resistance and ride quality according to the inspection and measurement methods set forth in Attachment 1 to this Maintenance Specification
All Maintained Elements in Element Category 'Structures' in Attachment 1 to this Maintenance Specification	Inspections and load rating calculations at the frequency specified in the CMA Documents. In addition, NBIS inspections as per FHWA regulations and at the frequency specified in FHWA regulations.

1910 Maintenance Contractor Audit Inspections

A. Maintenance Contractor shall undertake Audit Inspections of TxDOT's randomly selected Auditable Sections for audit purposes at least once quarterly. The Audit Inspections shall be designed such that over a period of one year the sample sections are statistically valid for 100% of the assets. Maintenance Contractor shall assess the condition of each Maintained Element using the inspection and measurement method set forth in the column entitled "Inspection and Measurement Method" in Attachment 1 to this Maintenance Specification.

B. Maintenance Contractor shall create a new Maintenance Record for each Maintained Element physically inspected in accordance with the column entitled "Measurement Record" on Attachment 1 to this Maintenance Specification. Audit Inspections shall be undertaken to a schedule agreed with TxDOT on Auditable Sections randomly selected by TxDOT. TxDOT shall be given the opportunity by seven days notice, to accompany Maintenance Contractor when it undertakes the physical inspections associated with the Audit Inspections.

1911 Asset Condition Score by Maintenance Contractor

A. Within ten days of the quarterly Audit Inspections, Maintenance Contractor shall assess its achievement of the Performance Requirements by self scoring against the Targets set forth on Attachment 1 to this Maintenance Specification.

B. Maintenance Contractor shall report quarterly to TXDOT an Asset Condition Score to include, for each Element Category, all of the Auditable Sections inspected in the most recent Audit Inspection. Maintenance Contractor shall assess the Asset Condition Score according to the measurement criteria set forth in Table 1911-1.

Table 1911-1 – Asset Condition Score Criteria for Element Categories
(Reported quarterly for each Element Category for all inspected Auditable Sections)

Score	Criteria
5	• Targets for individual Elements are almost entirely met (95% to 100% compliance with the relevant Targets for each Element within each Auditable Section), and • Is fully functional and in nearly new condition, meeting or exceeding Performance Requirement.
4	• Targets for individual Elements are substantially met (less than 95% compliance and 90% or greater compliance with the relevant Targets for each Element within each Auditable Section), and • Is functional and in good condition, meeting Performance Requirement.
3	• Targets for individual Elements are mostly met (less than 90% compliance and 75% or greater compliance with the relevant Targets for each Element within each Auditable Section), and • Is in fair condition, but suggesting need for early replacement, renewal or repair of individual Element and/or maintenance or operation improvement action to meet Performance Requirement.
2	• Targets for individual Elements are barely met (less than 75% compliance and 50% or greater compliance with the relevant Targets for each Element within each Auditable Section), or • In poor condition demonstrating need for immediate replacement, renewal or repair of individual Element and/or immediate change to MMP.
1	• Targets for individual Elements are not met (less than 50% compliance with the relevant Targets for each Element within each Auditable Section), or • In very poor condition demonstrating need for immediate replacement, renewal or repair of individual Element and/or immediate change to MMP.

Notes to Table 1911-1:

1. The Asset Condition Score for any Element Category shall be determined by the lowest Asset Condition Score for any Element within the Element Category. The calculation of Asset Condition Score is demonstrated by the following example:

Assume there are 52 Auditable Sections, of these 25%, or 13 are audited each quarter. If there are five Targets to be assessed for Element "pavement markings", there are therefore 5 x 13 = 65 measurement records for pavement markings. If 62 of these measurement records meet the Target, there would be 95.38% compliance and an Asset Condition Score of five assigned for that Element. However, if one of the remaining Elements in the Element Category achieves an Asset Condition Score of four the Asset Condition Score for the Element Category shall be four.

2. The mean of the Asset Condition Scores across Elements in any Element Category is calculated to 1 decimal point and also recorded.

3. Where a measurement record relates to a service measured over time or an Element that is not represented in more than 25% of Auditable Sections then the Asset Condition Score will be based on the total service and not a 5% random sample. This applies to the performance measurement of Element Categories: structures, traffic signals, Incident response, customer service, snow and ice control, facility buildings and toll equipment or other Element Categories meeting the above criteria identified following establishment of the Auditable Sections.

4. Pavement Condition Score is a component of Asset Condition Score for Element Category "Pavement", but Pavement Condition Score shall also be reported annually for the entire Project.

5. Developer acknowledges that Asset Condition Score is a mechanism to benchmark the performance of the Project against the performance of other similar facilities and that TxDOT may, during the Term, alter the Asset Condition Score criteria to reflect Good Industry Practice.

6. "Mean" in this context shall be the arithmetic mean.

C. Where specific Measurement criteria are not provided in Attachment 1 to this Maintenance Specification, Maintenance Contractor shall use Good Industry Practice to assess the Asset Condition Score against the general criteria stated in Table 1911-1.

2000 BICYCLE AND PEDESTRIAN FACILITIES

It is not envisioned that there will be any requirement for bicycle and pedestrian facilities caused by Maintenance Services. Bicycle and pedestrian facilities requirements due to reconstruction etc., shall be dealt with in accordance with appropriate sections of Development Agreement.

2100 TOLLING

Not used.

2200 OPERATIONS

Not used.

ATTACHMENT 1 TO THE MAINTENANCE SPECIFICATION
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:	100% 100%

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			
								• Mainlanes and ramps – 80 • Frontage roads – 70	100% 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: • Mainlanes, ramps – 95" per mile**	100% 100%

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 – 120" per mile**	
	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%
							(Capital Asset Replacement 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**	100% 100%
							10-ft straightedge used to measure discontinuities	IRI measured throughout 98% of each lane containing a bridge deck in any Auditable Section , 0.1 mile average – 200" per mile** Individual discontinuities greater than 0.75"	100% Nil

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			
							d) Failures Instances of failures exceeding the failure criteria set forth in the TxDOT PMIS Rater's Manual, including potholes, base failures, punchouts and jointed concrete pavement failures	Occurrence of any failure	Nil
	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 E274/E274M-11 Standard Test Method for Skid Resistance Testing of Paved Surfaces at 50 MPH using a full scale smooth tire meeting the requirements of ASTM E524-08 .	• 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 is in excess of 30.	100%

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							• 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. • 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% 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**	Potholes of low severity or higher (Number)	Nil

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			
							b) Base failures	Base failures of low severity or higher (Number)	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
	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	24 hrs	28 days	6 months	Visual inspection	Devices functioning correctly with means of operation displayed (Number)	100%

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			
			Emergency.						
	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 complies with the relevant legislation and permits.	24 hrs	28 days	6 months	Visual inspection and records	Non-compliances with legislation	Nil
	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	Substructures and superstructures are free of: • blocked drains, weep pipes manholes and chambers • blocked drainage holes in structural components • defects in joint sealants	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	Records as required in the TxDOT Bridge Inspection Manual Occurrences of condition rating below seven for any deck, superstructure or substructure	Nil

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			
		abutments or springlines of arches or extreme ends of openings or multiple boxes	• defects in pedestrian protection measure • scour damage • corrosion of rebar • paint system failures • impact damage by any Maintenance Contractor-Related Entity				Manual, and the Federal Administration's Bridge Inspector's Reference Manual.	All condition states to be one for all structure components	100%
	3.2	Structure components	i) Expansion joints are free of: • dirt debris and vegetation • defects in drainage systems • 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	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 cont.		• impact damage by any Maintenance Contractor-Related Entity iv) Bearings and bearing shelves are clean.	24 hrs	28 days	6 months			

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			
			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, 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	Nil Nil

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			
								Number with scour damage	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	24 hrs	28 days	6 months	Visual inspection	Number with loose assemblies Number with defects in surface protection	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
	3.6	Access points	All hatches and points of access have fully operational and lockable entryways.	24 hrs	28 days	6 months	Visual Inspection	Number with defects in locks or entryways	Nil
	3.7	Mechanically Stabilized Earth and Retaining Walls	Mechanically Stabilized Earth and Retaining Walls free of: • blocked weep holes • undesirable vegetation • defects in joint sealants	24 hours	28 days	6 months	Inspection and assessment in accordance with the requirements of federal Nations Bridge Inspection	Records as required in the TxDOT Bridge Inspection Manual	100%

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			
			• defects in pedestrian protection • scour damage • corrosion of reinforcing bars • paint system failure • concrete spalling • impact damage by any Maintenance Contractor-Related Entity Parapets free of: • loose nuts and bolts • blockage of drain holes • undesirable vegetation • impact damage by any Maintenance Contractor-Related Entity • concrete spalling				Standards (NBIS) of the Code of Federal Regulations, 23 Highways - Part 650, the TxDOT Bridge Inspection Manual and the Federal Highway Administration's Bridge Inspector's Reference Manual.		
4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS									

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			
	4.1	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	100%
								Length meeting the minimum retroreflectivity 125 mcd/sqm/lx for yellow	100%
							Physical measurement	Length with more than 5% loss of area of material at any point	Nil
								Length with spread more than 10% of specified dimensions.	Nil
							b) Profile Markings Visual inspection	Length performing its intended function and compliant with relevant regulations	100%

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

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	24 hrs	28 days	6 months	**a) Retroreflectivity** Coefficient of retro reflectivity	Number of signs with reflectivity below the requirements of TxDOT's TMUTCD	Nil
			ii) Identification markers are provided, correctly located, visible, clean and legible				**b) Face damage** Visual inspection	Number of signs with face damage greater than 5% of area	Nil

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				**e) Sign Information** Visual inspection **f) Dynamic Message Signs** Visual inspection	Sign information is of the correct size, location, type and wording to meet its intended purpose Dynamic message signs are fully functioning	100% 100%

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			
			in accordance with the 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	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%

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			
			during a period of failure						
	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									

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			
	8.1	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
	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

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			
	8.5	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%
	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									

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			
	10.1	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
	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%

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			
			v) A full width mowing cycle is completed after the first frost. vi) Wildflowers are preserved utilizing the guidelines in the mowing specifications and TXDOT *Roadside Vegetation Manual*.				**e) Sight lines** Visual inspection	Instances of impairment of sight lines or sight distance to signs	Nil

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 MMP. 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

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

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

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					Number of unsealed cracks	Nil

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			
			parking and travel areas are clearly marked. x) All curbs are in place and intact.					> ½ inch. 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%

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%

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			
	13.2	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%

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)									

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%
	15.2	Animals	All dead or injured animals are removed from the ROW	2 hrs	N/A	N/A	Visual inspection	No dead or injured animals are present on ROW	
	15.3	Abandoned vehicles and equipment	All abandoned vehicles and equipment are removed from the ROW.	1 hr	24 hrs	N/A	Visual inspection	No abandoned vehicles or equipment present	
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%

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			
	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%
17) INCIDENT RESPONSE									
	17.1	General	Respond to Incidents in accordance with the Maintenance Management Plan (MMP).	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 Maintenance Management Plan (MMP).	1 hr	N/A	N/A	MMP 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%

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			
	17.4	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	24 hrs	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%
	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.		

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			
	18.2	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 without stockpiling in the right of way and dispose of at approved tip.	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%
	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%

ATTACHMENT 2 TO THE MAINTENANCE SPECIFICATION : ELEMENTS FOR WHICH MAINTENANCE SERVICES ARE TO BE PROVIDED.

Maintenance Contractor shall maintain the Elements marked 'R' in column A to achieve the Performance Requirements set forth in Attachment 1 to Series 1900 of the Maintenance Specification.

ELEMENT CATEGORY	REF	ELEMENT	REQUIRED		
			A	B	C
1) ROADWAY					
	1.1	Obstructions and debris			
	1.2	Pavement	R		
	1.3	Crossovers and other paved areas	R		
	1.4	Joints in concrete	R		
	1.5	Curbs	R		
2) DRAINAGE					
	2.1	Pipes and Channels			
	2.2	Drainage treatment devices			
	2.3	Travel Way			
	2.4	Discharge systems			
	2.5	Protected species			
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	R		
	3.2	Structure components	R		
	3.3	Non-bridge class culverts			
	3.4	Gantries and high masts	R		
	3.5	Load ratings	R		
	3.6	Access points			
	3.7	Mechanically Stabilized Earth and Retaining Walls	R		
4) PAVEMENT MARKINGS, OBJECT MARKERS, BARRIER MARKERS AND DELINEATORS					
	4.1	Pavement markings			
	4.2	Raised reflective markers			
	4.3	Delineators & Markers			

ELEMENT CATEGORY	REF	ELEMENT	REQUIRED		
			A	B	C
5) GUARDRAILS, SAFETY BARRIERS AND IMPACT ATTENUATORS					
	5.1	Guard rails and safety barriers			
	5.2	Impact attenuators			
6) TRAFFIC SIGNS					
	6.1	General – All Signs			
	6.2	General - Safety critical signs			
7) TRAFFIC SIGNALS					
	7.1	General			
	7.2	Soundness			
	7.3	Identification marking			
	7.4	Pedestrian Elements and Vehicle Detectors			
8) LIGHTING					
	8.1	Roadway Lighting – General			
	8.2	Sign Lighting			
	8.3	Electrical Supply			
	8.4	Access Panels			
	8.5	High Mast Lighting			
9) FENCES, SOUND WALLS AND ABATEMENT					
	9.1	Design and Location			
	9.2	Construction			
10) ROADSIDE MANAGEMENT					
	10.1	Vegetated Areas – Except landscaped areas – General			
	10.2	Landscaped Areas			
	10.3	Fire Hazards			
	10.4	Trees, brush and ornamentals			
	10.5	Wetlands			
11) REST AREAS AND PICNIC AREAS					
	11.1	Rest areas and picnic areas			
12) EARTHWORKS, EMBANKMENTS AND CUTTINGS					
	12.1	Slope Failure	R		
	12.2	Slopes - General	R		
13) ITS and ETCS EQUIPMENT					
	13.1	ETCS Equipment – Maintenance			
	13.2	VES Equipment - Maintenance			

ELEMENT CATEGORY	REF	ELEMENT	REQUIRED		
			A	B	C
	13.3	Dynamic Message Sign Equipment			
	13.4	CCTV Equipment			
	13.5	Vehicle Detection Equipment			
14) TOLLING Facilities and Buildings (Not Used)					
15) AMENITY					
	15.1	Graffiti			
	15.2	Animals			
	15.3	Abandoned vehicles and equipment			
16) SNOW AND ICE CONTROL					
	16.1	Travel lanes			
	16.2	Weather Forecasting			
	16.3	Operational Plans			
17) INCIDENT RESPONSE					
	17.1	General			
	17.2	Hazardous Materials			
	17.3	Structural assessment			
	17.4	Temporary and permanent remedy			
18) CUSTOMER RESPONSE					
	18.1	Response to inquiries			
	18.2	Customer contact line			
19) SWEEPING AND CLEANING					
	19.1	Sweeping			
	19.2	Litter			

ATTACHMENT 3 TO THE MAINTENANCE SPECIFICATION : LIMITS FOR MAINTENANCE SERVICES

The limits for Maintenance Services are defined by the physical limits of all Work under the Development Agreement associated with Segment F1, F2, and G as defined in the Development Agreement.

Maintenance Contractor shall be responsible for the Maintenance Services within the above defined physical limits for all applicable Element Categories subject to the following limitations:

No limitations specified for this project.

ATTACHMENT 4 -

Not used.

ATTACHMENT 5 : PUBLIC INFORMATION OFFICE OPENING HOURS

Not used.

ATTACHMENT 6 : RESTRICTIONS ON TRAFFIC MANAGEMENT

Lane Closure restrictions for maintenance work will be as follows:

No Lane Closure that restricts or interferes with traffic shall be allowed from noon on the day preceding to 10:00 PM on the day after the following holiday schedule. For this Project, unless otherwise noted in the plans and/or as directed by TxDOT, daily Lane Closures shall be limited according to the following restrictions:

A. General restrictions for Grand Parkway mainlanes, ramps, frontage roads and arterials:

I. New Year's Eve and New Year's Day (December 31 through January 1)
II. Easter Holiday Weekend (Friday through Sunday)
III. Memorial Day Weekend (Friday through Monday)
IV. Independence Day (July 3 through noon on July 5)
V. Labor Day Weekend (Friday through Monday)
VI. Thanksgiving Holiday (Wednesday through Sunday)
VII. Christmas Holiday (December 23 through December 26)
VIII. No Lane Closures will be permitted between 5:30 A.M. and 8:00 P.M. Monday through Thursday and between 5:30 A.M. Friday and 3:00 A.M. Saturday.
IX. At least two through mainlanes in each direction must be open between 8:00 P.M. and 10:00 P.M. Monday through Thursday, and between 3:00 A.M. Saturday through 10:00 P.M. Sunday.
X. At least one through mainlane in each direction must be open between 10:00 P.M. and 5:30 A.M. Sunday through Friday.
XI. Complete closure of the mainlanes will not be allowed, unless approved by the TxDOT.

B. Frontage roads and arterial crossings:

I. No Lane Closures will be permitted between 5:30 A.M. and 9:00 P.M. Monday through Thursday and between 5:30 A.M. Friday and 3:00 A.M. Saturday.
II. At least one lane in each direction shall remain open from 9:00 P.M. and 5:30 A.M. Monday through Thursday nights and between 3:00 Saturday and 5:30 A.M. Monday.
III. Provide and maintain access to properties and businesses adjacent to the right-of-way at all times unless otherwise directed by the TXDOT.
IV. No mainlane and frontage road closures may occur at the same time, unless approved by the TXDOT.

C. Ramps:

I. No two adjacent ramp closures may occur at the same time.