Texas Department of Transportation

TECHNICAL PROVISIONS

FOR

US 181 HARBOR BRIDGE PROJECT

Comprehensive Development Agreement

Final Request for Proposals

October 2, 2014

Table of Contents

1 GENERAL 1
1.1 Project Limits 1
1.2 Basic Configuration 1
1.3 Project Requirements 4
1.3.1 Additional Scope Option Work 5
2 PROJECT MANAGEMENT 1
2.1 Administrative Requirements 1
2.1.1 Project Schedule 1
2.1.2 Document Management 14
2.2 Quality Management Plan 15
2.2.1 General Requirements 15
2.2.2 Quality Terminology 16
2.2.3 Quality Management Organization 16
2.2.4 Quality Policy 16
2.2.5 Inspection and Testing 16
2.2.6 Responsibility and Authority of Developer Staff 17
2.2.7 Professional Services Quality Management Plan 18
2.2.8 Construction Quality Management Plan 25
2.2.9 Maintenance Management Plan 29
2.3 Comprehensive Environmental Protection Plan 29
2.4 Public Information and Communications Plan 29
2.5 Safety and Health Plan 29
2.6 TxDOT-Developer Communications Plan 32
2.7 Right of Way Acquisition Plan 32
2.8 Risk Management Plan 32
2.9 Corpus Christi Ship Channel Plan 33
2.9.1 General Requirements 33
2.9.2 Requirements for the CCSP 33
2.9.3 Sweep and Sounding Surveys 34
2.10 Sustainability Plan 35
2.11 TxDOT Offices, Equipment and Vehicles 37
2.11.1 Computers and Equipment 37
2.11.2 Core Office 38
2.11.3 Field Offices 41

2.12 3-D Design 43
2.12.1 General Requirements 43
2.12.2 Design Requirements 44
3 PUBLIC INFORMATION AND COMMUNICATIONS 1
3.1 General Requirements 1
3.2 Administrative Requirements 1
3.2.1 Public Information and Communications Plan 1
3.2.2 Project Status Reports 3
3.2.3 Public Information Coordinator 4
3.2.4 Public Information Office and Hotline 4
3.2.5 Customer Groups 5
3.2.6 Events 5
3.2.7 Meeting Summaries 7
3.2.8 Communication Tools 7
3.2.9 Lane Closure Notification 8
3.2.10 Emergency Event Communications 8
3.2.11 Third Party Claims 8
4 ENVIRONMENTAL 1
4.1 General Requirements 1
4.2 Environmental Approvals 1
4.2.1 New Environmental Approvals and Amended TxDOT-Provided Approvals 1
4.2.2 Responsibilities Regarding Environmental Studies 2
4.2.3 TxDOT Review and Approval of Developer Submissions 2
4.2.4 TxDOT-Provided Approvals 2
4.3 Comprehensive Environmental Protection Program 2
4.3.1 Environmental Management System 3
4.3.2 Environmental Compliance and Mitigation Plan 4
4.3.3 Environmental Protection Training Plan 8
4.3.4 EPTP Participation 9
4.3.5 Hazardous Materials Management Plan 9
4.3.6 Communication Plan 11
4.3.7 Construction Monitoring Plan 11
4.3.8 Recycling Plan 12
4.4 Environmental Personnel 12
4.4.1 Environmental Compliance Manager 12
4.4.2 Environmental Training Staff 13

4.4.3 Environmental Compliance Inspectors 13
4.4.4 Cultural Resource Management Personnel 13
4.4.5 Natural Resource Biologist 14
4.4.6 Water Quality Specialist 14
4.4.7 Hazardous Materials Manager 14
4.5 Property Access 14
4.6 Dust Control 15
4.7 Asbestos Containing Material 15
4.8 Lead Containing Paint 15
4.9 Other Hazardous Materials 15
5 THIRD PARTY AGREEMENTS 1
5.1 General Requirements 1
5.2 Traffic Signals 1
5.3 Roadway Illumination 1
5.4 Other Affected Third Parties 1
6 UTILITY ADJUSTMENTS 1
6.1 General Requirements 1
6.1.1 When Utility Adjustment is Required 1
6.1.2 Certain Components of the Utility Adjustment Work 2
6.1.3 Agreements Between Developer and Utility Owners 3
6.1.4 Recordkeeping 4
6.2 Administrative Requirements 4
6.2.1 Standards 4
6.2.2 Communications 4
6.2.3 Utility Adjustment Team 5
6.2.4 Real Property Matters 5
6.3 Design 6
6.3.1 Developer's Responsibility for Utility Identification 6
6.3.2 Technical Criteria and Performance Standards 7
6.3.3 Utility Adjustment Concept Plans 7
6.3.4 Utility Adjustment Plans 7
6.4 Construction 10
6.4.1 Reserved 10
6.4.2 General Construction Criteria 10
6.4.3 Inspection of Utility Owner Construction 10
6.4.4 Scheduling Utility Adjustment Work 10

6.4.5 Standard of Care Regarding Utilities 11
6.4.6 Emergency Procedures 11
6.4.7 Utility Adjustment Field Modifications 11
6.4.8 Switch Over to New Facilities 12
6.4.9 Record Drawings 12
6.4.10 Maintenance of Utility Service and Access 12
6.4.11 Traffic Control 12
6.5 Deliverables 12
6.5.1 Maximum Number of Submittals 13
6.5.2 Developer's Utility Tracking Report 13
6.5.3 Utility Assembly Submittals and Final Closeout Procedures 14
6.5.4 FHWA Alternate Procedure 14
7 RIGHT OF WAY (ROW) 1
7.1 General Requirements 1
7.2 Administrative Requirements 1
7.2.1 Standards 1
7.2.2 Software Requirements 2
7.2.3 ROW Acquisition Plan 2
7.2.4 Schedule and Review Procedures 2
7.2.5 Developer's Project ROW Scope of Services 3
7.2.6 Acquisition Process Summary 4
7.2.7 ROW Personnel Qualifications 5
7.2.8 Developer Conflict of Interest 6
7.2.9 Meetings 6
7.2.10 Documentation and Reporting 6
7.2.11 Responsibilities of Developer 7
7.2.12 Responsibilities of TxDOT 8
7.2.13 TxDOT Project Monitor/Reviewer 9
7.2.14 Responsibilities of the Office of the Attorney General 9
7.3 Pre-Acquisition Activities 10
7.3.1 Project ROW Surveying and Mapping 10
7.3.2 Additional Reporting Requirements 14
7.3.3 Title Services 15
7.3.4 Introduction to Property Owners 15
7.3.5 Appraisals 16

7.3.6 Project ROW Acquisition Package Approval 19
7.4 Acquisition Activities 20
7.4.1 ROW Negotiations 20
7.4.2 Relocation Assistance 22
7.4.3 Closing Services 24
7.4.4 Condemnation Support 25
7.4.5 Clearance/Demolition of Project ROW 27
7.4.6 Payment Schedule 28
7.4.7 Property Fence 28
7.4.8 *Property Fencing for Public Properties* 28
7.4.9 Property Fencing for Private Properties 28
7.5 Early ROW Acquisition 29
8 GEOTECHNICAL 1
8.1 General Requirements 1
8.2 Design Requirements 1
8.2.1 Subsurface Geotechnical Investigation by Developer 1
Pavement Design 2
8.3 Construction Requirements 9
8.3.1 Pavement Materials Requirements 9
8.3.2 Construction Verification 10
9 LAND SURVEYING 1
9.1 General Requirements 1
9.2 Administrative Requirements 1
9.2.1 Standards 1
9.2.2 Right-of-Entry 1
9.2.3 Survey by TxDOT 1
9.3 Design Requirements 1
9.3.1 Units 1
9.3.2 Survey Control Requirements 1
9.3.3 Conventional Method (Horizontal and Vertical) 2
9.3.4 Right of Way Surveys 3
9.3.5 Survey Records and Reports 4
9.4 Construction Requirements 5
9.4.1 Units 5
9.4.2 Construction Surveys 5
9.5 Deliverables 5

9.5.1 Survey Records 5
9.5.2 Final ROW Surveying and Mapping 5
9.5.3 ROW Monuments 5
9.5.4 Record Drawings and Documentation 6
10 GRADING 1
10.1 General Requirements 1
10.2 Preparation within Project Limits 1
10.3 Slopes and Topsoil 1
11 ROADWAYS 1
11.1 General Requirements 1
11.2 Design Requirements 1
11.2.1 Control of Access 1
11.2.2 Roadway Design Requirements 1
11.2.3 Miscellaneous Roadway Design Requirements 5
12 DRAINAGE 1
12.1 General Requirements 1
12.2 Administrative Requirements 1
12.2.1 Data Collection 1
12.2.2 Coordination with Other Agencies 2
12.3 Design Requirements 2
12.4 Surface Hydrology 4
12.4.1 Design Frequencies 4
12.4.2 Storm Sewer Systems 5
12.4.3 Not Used 6
12.4.4 Detention Ponds 6
12.4.5 Hydraulic Structures 6
12.5 Drainage Design Report 9
12.6 Construction Requirements 9
13 STRUCTURES 1
13.1 General Requirements 1
13.2 Design Requirements 1
13.2.1 Bridge 1
13.2.2 Retaining Walls 16
13.2.3 Noise Walls 17
13.2.4 Drainage Structures 17
13.2.5 Sign, Illumination, and Traffic Signal Supports 17

13.3 Construction Requirements 17
13.3.1 Erection 17
13.3.2 Bridge Demolition 18
13.3.3 Stay Cable Stressing 19
13.3.4 Structure Metals 19
13.3.5 Waterproofing 19
13.3.6 Concrete Mix Design 19
13.3.7 Concrete Finishes 19
13.3.8 Steel Finishes 20
13.3.9 Temporary Works 20
13.4 Deliverables 20
14 RAIL 1
14.1 General Requirements 1
14.2 Projects Impacting Railroad ROW 1
14.3 Railroad Agreements 1
14.4 Railroad Design Standards 2
14.4.1 Design Criteria 2
14.5 Administrative Requirements 3
14.5.1 Project Work Affecting Railroad Operations 3
14.5.2 Railroad Agreement 3
14.5.3 Agreement for Construction, Maintenance and Use of Right of Way 3
14.5.4 Operational Safety 3
14.5.5 Railroad Right of Entry Agreement 3
14.5.6 Insurance Requirements 4
14.6 Construction Requirements 4
14.6.1 Flagging 4
14.6.2 Safety Certification 4
14.7 Port of Corpus Christi Rail Lines 4
14.7.1 Design Criteria 4
14.7.2 Flagging 4
15 AESTHETICS AND LANDSCAPING 1
15.1 General Requirements 1
15.2 Administrative Requirements 1
15.2.1 Aesthetics Concepts 1
15.2.2 Aesthetics and Landscaping Plans 1
15.2.3 3-D Computer-Generated Visualizations 2

15.2.4 4-D Animation 3
15.2.5 Architectural Bridge Model 3
15.2.6 Personnel 3
15.3 Design Requirements 4
15.3.1 Aesthetics Principles and Strategies 4
15.3.2 Bridges 4
15.3.3 Culverts 5
15.3.4 Retaining Walls 5
15.3.5 Noise/Sound Walls 5
15.3.6 Traffic Railings 5
15.3.7 Shared-Use Path 5
15.3.8 Lighting 5
15.3.9 Architectural Lighting 6
15.3.10 Signing 6
15.3.11 Fencing 6
15.3.12 Color and Surface Palette 6
15.3.13 Trees, Shrubs, and Other Plant Materials 6
15.3.14 Maintenance and Establishment Period 6
15.3.15 Grading 7
15.3.16 Riprap 7
15.3.17 Utilities 7
15.4 Construction Requirements 7
15.5 Deliverables 8
16 SIGNING, DELINEATION, PAVEMENT MARKING, SIGNALIZATION, AND LIGHTING 1
16.1 General Requirements 1
16.2 Administrative Requirements 1
16.2.1 Meetings 1
16.3 Design Requirements 1
16.3.1 Final Design 1
16.3.2 Signing and Delineation 1
16.3.3 Project Signs – Outside the Project ROW 2
16.3.4 Not Used 2
16.3.5 Not Used 2
16.3.6 Sign Support Structures 2
16.3.7 Pavement Marking 2

16.3.8 Signalization 2
16.3.9 Lighting 5
16.3.10 Visual Quality 7
16.4 Construction Requirements 7
16.4.1 Permanent Signing and Delineation 7
16.4.2 Permanent Pavement Marking 7
16.4.3 Permanent Signalization 7
16.4.4 Permanent Lighting 7
16.4.5 Reference Markers 8
17 INTELLIGENT TRANSPORTATION SYSTEMS 1
17.1 General Requirements 1
17.2 Design Requirements 1
17.2.1 ITS Communications Requirements 1
17.2.2 Conduit 2
17.2.3 CCTV Cameras 2
17.2.4 Vehicle Detection 4
17.2.5 Road Weather Information System 4
17.2.6 Emergency Callbox 4
17.2.7 Dynamic Message Signs 4
17.2.8 Communication Hub Enclosures/Communication Cabinets 5
17.3 Construction Requirements 5
17.3.1 General 5
17.3.2 Salvaging Existing Items 5
17.3.3 Existing ITS Relocation 6
18 TRAFFIC CONTROL 1
18.1 General Requirements 1
18.2 Administrative Requirements 1
18.2.1 Traffic Management Plan 1
18.3 Design Requirements 2
18.3.1 Traffic Control Plans 2
18.3.2 Time Period for Closures 5
18.3.3 Restricted Hours 5
18.4 Construction Requirements 5
18.4.1 Developer Responsibility 6
18.4.2 Access 6
18.4.3 Detours 6

18.4.4 Local Approvals 6
18.4.5 Pavement Markings and Signing 6
18.4.6 Reinstatement of Utility Cuts 6
18.4.7 Hauling Equipment 7
18.4.8 Final Clean-Up 7
18.4.9 Stockpiles 7
19 MAINTENANCE 1
19.1 General Requirements 1
19.1.1 O&M Work Durations 1
19.1.2 General Maintenance Obligations 1
19.1.3 Developer's Maintenance Facility 2
19.2 Operations and Maintenance Limits 2
19.3 Scope of O&M During Construction and O&M After Substantial Completion 3
19.4 Performance Requirements 4
19.4.1 Application of Performance and Measurement Baseline Tables 4
19.4.2 O&M During Construction 5
19.4.3 Updates of Performance and Measurement Baseline Tables 5
19.4.4 Categorization of Defects 6
19.4.5 Obligation to Remedy and Repair 6
19.5 Renewal Work Requirements 7
19.5.1 Obligation to perform Renewal Work 7
19.5.2 O&M Work Schedule 8
19.6 Maintenance Management Plan 9
19.6.1 Maintenance Management Plan Submittal Requirements 9
19.6.2 MMP General Requirements 9
19.6.3 O&M Work Deliverable Schedule 10
19.6.4 Maintenance Document Management Plan 11
19.6.5 Communications Plan 11
19.6.6 Maintenance Safety Plan 11
19.6.7 Hazardous Materials Management Plan 12
19.6.8 Environmental Compliance and Mitigation Plan 13
19.6.9 Maintenance Management System 13
19.6.10 Operations Plan 15
19.7 O&M Work Quality Management Plan 15
19.7.1 General Requirements 15

19.7.2 Quality Management of Renewal Work 15
19.7.3 O&M Work QMP Requirements 16
19.7.4 Personnel and Staffing 16
19.8 Maintenance Transition Plan 16
19.9 Inspections 17
19.9.1 General Inspections 17
19.9.2 Specialist Inspections 18
19.9.3 Routine Biennial Inspections of New Harbor Bridge 19
19.9.4 Inspection of Access Systems 19
19.9.5 Bridges / Structures Inspections Requirements for Roadway Section 20
19.9.6 Special Bridge Inspections 20
19.9.7 Developer Performance Inspections 20
19.9.8 Asset Condition Score 21
19.10 Operational Services 23
19.10.1 Operational Services General 23
19.10.2 Metered Utility Consumption Costs 24
19.10.3 Incident Detection and Response Compliance 24
19.10.4 Roadway Reopening Time Policy Compliance 25
19.10.5 Incident Management Plan 25
19.10.6 Policing 26
19.10.7 Response to Adverse Weather 26
19.10.8 Oversize / Overweight Permits 27
19.11 Traffic Control for O&M Work 27
19.11.1 Public Information and Communications 27
19.12 Reporting Requirements 27
19.12.1 Reporting and Books and Records 27
19.12.2 Quarterly Maintenance Work Report 28
19.12.3 Quarterly Operations Report 28
19.12.4 Annual Report 29
19.13 Additional Requirements 29
19.13.1 Rail 29
19.13.2 Landscaping 29
19.14 Handback Requirements 29
19.14.1 General 29
19.14.2 Handback Plan 29

19.14.3 Durability Plan 30
19.14.4 Residual Life Inspections 31
19.14.5 New Harbor Bridge Structures Residual Life Inspection Requirements 32
19.14.6 New Harbor Bridge Residual Life Methodology Requirements for Structures 32
19.14.7 New Harbor Bridge Residual Life Inspection Requirements for Bridge Wearing Surface 32
19.14.8 Roadway Section Residual Life Pavement Inspections 33
19.14.9 Roadway Section Residual Life Methodology 33
19.14.10 Roadway Section Residual Life Structures Inspections 33
19.14.11 Roadway Section Residual Life Drainage Inspections 34
19.14.12 O&M Work Schedule for Handback Requirements 34
19.14.13 Handback Requirements for Bridge Access Inspection System. 34
20 BICYCLE AND PEDESTRIAN FACILITIES 1
20.1 General Requirements 1
20.2 Administrative Requirements 1
20.2.1 Meetings 1
20.2.2 Coordination with Other Agencies 1
20.3 Design Requirements 1
20.3.1 Shared Use Path and Bicycle Facilities 2
20.3.2 Pedestrian Facilities 2

LIST OF ATTACHMENTS

Attachment 1-1 – Project Limits

Attachment 1-2 – Option 1 Work

Attachment 1-3 – Option 2 Work

Attachment 2-1 – Project Management Plan Contents

Attachment 2-2 – Work Breakdown Structure Requirements

Attachment 2-3 – Organizational Structure for Cost Reporting

Attachment 2-4 – I2MS Test Form Fields

Attachment 5-1 – Texas Department of Transportation Municipal Maintenance Agreement

Attachment 5-2 – NPDES Permit

Attachment 6-1 – Project Utility Adjustment Agreement Forms (PUAA)

Attachment 7-1 – Port Authority Buildings / Improvements to be Demolished

Attachment 13-1 – Structure Provisions

Attachment 13-2 – New Harbor Bridge Clearance Requirements

Attachment 14-1 – Amendments for TxDOT's Traffic Operations Manual, Railroad Operations Volume, February 2000

Attachment 15-1 – Aesthetic Guidelines

Attachment 19-1 – Performance & Measurement Table During for New Harbor Bridge O&M after Substantial Completion

Attachment 19-2 – Performance & Measurement Table Baseline for Roadway Section O&M during Construction

Attachment 19-3 – Performance & Measurement Table Baseline for Roadway Section O&M after Substantial Completion

Attachment 19-4 – Operations & Maintenance Limits Exhibit

Attachment 19-5 – Asset Condition Score New Harbor Bridge

Attachment 19-6 – Asset Condition Score Roadway Section O&M after Substantial Completion

Attachment 19-7 – TxDOT Function Codes for Maintenance Management System

Attachment 19-8 – Baseline Inspection Requirements

1 GENERAL

1.1 Project Limits

The Project includes the design, construction, and maintenance of the New Harbor Bridge, and portions of US Highway 181 (US 181), Interstate Highway 37 (I-37), Crosstown Expressway (SH 286), the connection of Upper and Lower Broadway Street to I-37 and the demolition of the existing Harbor Bridge in Corpus Christi, Texas. The Project limits extend both north-south along US 181 and the Crosstown Expressway and east-west along I-37 and include: US 181 at Beach Avenue on the north; Crosstown Expressway at Laredo Street on the south; I-37 and Nueces Bay Boulevard on the west; and I-37 and Mesquite Street on the east side with a total length of 6.44 miles. Refer to Attachment 1-1, Project Limits.

1.2 Basic Configuration

The Basic Configuration includes a proposed new location six-lane controlled-access facility within the Schematic ROW, comprised generally of the construction of freeway lanes, bridges, ramps, new connections, multi-level interchange including direct connectors and intersection improvements. The Basic Configuration includes the following components in the approximate configuration shown on the Schematic Design.

- Number of mainlanes: 3 in each direction
- Interchanges: I-37/US 181-SH 286
- Mainlane bridges:
  - US 181/SH 286 Northbound and Southbound from approximate Station 1011+44 to Station 1022+49
  - US 181/SH 286 Northbound and Southbound from approximate Station 1041+20 to Station 1169+18
  - I-37 Eastbound and Westbound from approximate Station 120+70 to Station 130+90
  - I-37 Eastbound and Westbound from approximate Station 138+40 to Station 145+30
- Ramps:
  - Beach Street to US 181 southbound entrance ramp
  - US 181 to Beach Street northbound exit ramp
  - US 181 to Burleson Street southbound exit ramp
  - Leopard Street/ I-37 to US 181 northbound entrance ramp
  - US 181 to Leopard Street/ I-37 southbound exit ramp
  - SH 286 to Leopard Street/ I-37 northbound exit ramp
  - I-37 to Staples Street/US 181-SH286 westbound exit ramp
  - I-37 to Staples Street eastbound exit ramp
  - Staples Street to I-37 westbound entrance ramp
  - US 181-SH286 to I-37 eastbound entrance ramp
  - I-37 to Nueces Bay Boulevard westbound exit ramp

- Nueces Bay Boulevard to I-37 eastbound entrance ramp
- North Port Avenue to I-37 westbound entrance ramp
- I-37 to North Port Avenue eastbound exit ramp
- US 181-SH286 to I-37 westbound DC to Nueces Bay Boulevard westbound exit ramp

- Direct connects
  - Southbound US 181 to westbound I-37
  - Eastbound I-37 to northbound US 181
  - Northbound SH 286 to westbound I-37
  - Eastbound I-37 to southbound SH 286
- Intersections:
  - US 181 NB/SB Frontage Roads with Beach Avenue
  - US 181 NB/SB Frontage Roads with Burleson Street
  - US 181 NB/SB Frontage Roads with Lake Street
  - US 181 NB/SB Frontage Roads with I-37 WB Frontage Road
  - SH 286 NB/SB Frontage Roads with I-37 EB Frontage Road
  - SH 286 NB/SB Frontage Roads with Leopard Street
  - SH 286 NB/SB Frontage Road with Mestina Street
  - SH 286 NB/SB Frontage Road with Lipan Street
  - SH 286 NB/SB Frontage Roads with Comanche Street
  - Buffalo Street with Artesian Street
  - Padre Street with Waco Street
  - Padre Street with I-37 WB Frontage Road
  - I-37 EB/WB Frontage Roads with Staples Street
  - I-37 EB/WB Frontage Roads with Alameda Street
  - I-37 EB Frontage Road with Josephine Street
  - I-37 EB Frontage Road with Mexico Street
  - I-37 WB Frontage Road with Coke Street
  - I-37 EB/WB Frontage Roads with Cleveland Street
  - I-37 EB/WB Frontage Roads with Doss Street
  - I-37 EB Frontage Road with Lester Street
  - I-37 EB/WB Frontage Roads with North Port Avenue
  - I-37 EB/WB Frontage Roads with Lexington Avenue
  - I-37 WB Frontage Road with Kennedy Avenue
  - I-37 WB Frontage Road with Noakes Street

- I-37 EB/WB Frontage Roads with Peabody Avenue
- Antelope Street with Peabody Avenue
- I-37 EB Frontage Road with Antelope Street
- I-37 WB Frontage Road with Stillman Avenue
- I-37 WB Frontage Road with Van Loan Avenue
- Palm Drive with Buffalo Street
- I-37 EB Frontage Road with Buffalo Street
- I-37 WB Frontage Road with Palm Drive
- I-37 WB Frontage Road with Floral Street
- Broadway Boulevard with Belden Drive (Option 1 Work)
- Broadway Boulevard with Power Street (Option 1 Work)
- Broadway Boulevard with Palo Alto Street (Option 1 Work)
- Broadway Boulevard with Fitzgerald Street (Option 1 Work)
- Broadway Boulevard with Resaca Street (Option 1 Work)
- Broadway Boulevard with Hughes Street (Option 1 Work)
- Broadway Boulevard with Brewster Street (Option 1 Work)
- Broadway Boulevard with Hirsch Street/Port Avenue (Option 1 Work)
- Broadway Boulevard with Harbor Drive (Option 1 Work)

- Removals:
  - Existing Harbor Bridge
  - East Causeway Boulevard from Beach Avenue to Coastal Avenue
  - West Causeway Boulevard from Beach Avenue to Market Street
  - Gulfspray Avenue access to US 181 NB Frontage
  - Surfboard Avenue access to US 181 NB Frontage
  - Treasure Avenue access to US 181 NB Frontage
  - Tourist Avenue access to US 181 NB Frontage
  - St. Charles Street access to US 181 NB Frontage
  - Churchdale Avenue access to US 181 NB Frontage
  - Seagull Boulevard access to US 181 NB Frontage
  - Elm Street access to East Causeway Boulevard
  - Winnebago Street from the east side to TC Ayers Park to Coke Street
  - N. Brownlee Boulevard from Winnebago Street to Lipan Street
  - Lipan Street from N. Brownlee Boulevard to N. Culberson Street
  - Mesquite Street from Hirsch Street to Harbor Drive

- I-37 WB entrance ramp from Mesquite Street
- I-37 WB entrance ramp from Padre Street
- I-37 EB exit ramp to Artesian Street/Buffalo Street
- I-37 EB entrance ramp from Artesian Street/Buffalo Street
- I-37 WB exit ramp to Brownlee Boulevard
- I-37 WB entrance ramp from Brownlee Boulevard
- SH 286 NB to EB I-37 Direct Connect
- I-37 WB to SB SH 286 Direct Connect
- N Lower Broadway to existing US 181 NB Direct Connect over I-37
- Existing US 181 SB to N Upper Broadway/Twigg Street Direct Connect over I-37
- Existing US 181 SB to I-37 WB Direct Connect
- I-37 EB to existing US 181 NB Direct Connect
- I-37 WB to existing US 181 NB Direct Connect
- Alameda Street Pedestrian Bridge over I-37
- N Lower Broadway to US 181 Direct Connect over I-37 pedestrian ramp and stairs at the old Courthouse

- Remove/Replace:
  - US 181/SH 286 mainlane bridge over Beach Avenue
  - Comanche Street bridge over US 181/SH 286
  - Staples Street bridge over I-37
  - Stillman Avenue Pedestrian Bridge over I-37 and frontage

1.3 Project Requirements

Developer shall replace sidewalks and driveways affected by its local street improvements. Refer to the appropriate section in these Technical Provisions for the specific Element requirements. The extent of the Work on the local streets shall be in compliance with the applicable codes (TDLR, ADA, for example).

The existing Carancahua and Tancahua Street bridges over I-37 are not required to be re-constructed and may remain in place, subject to compliance with the Performance Requirements and Handback Requirements for existing structures.

The Final Design shall provide for a smooth transition from the Project's scope of Work to the existing conditions at the tie-ins. Developer shall design and construct the Project to minimize the cost of throw-away construction associated with providing for the transitions to the existing configuration. Developer shall also provide for minimal disruption to traffic operations throughout the performance of the Work.

Developer shall repair or replace any existing Elements to remain in place which are damaged by the Work.

Reference to TxDOT's *Roadway Design Manual* in the Contract Documents shall mean the December 2013 version of TxDOT's *Roadway Design Manual*.

Developer will restore connectivity to the local streets along the existing US 181 alignment from Burleson Street to the southern terminus of Surfside Boulevard; including Surfside Boulevard, Breakwater Avenue, Bridgeport Avenue, Seigler Street, Seagull Boulevard, Walnut Street, Causeway Boulevard, Timon Boulevard, Plum Street and Burleson Street.

1.3.1 Additional Scope Option Work

1.3.1.1 Option 1 Work

Option 1 Work includes the addition of the Broadway Boulevard from Harbor Drive to I-37. The scope of Option 1 Work includes the design and construction of a four-lane divided boulevard section as shown in Attachment 1-2. This work includes all applicable pavement, drainage, curb & gutter, sidewalks, ADA ramps, grading, lighting, signals, striping and signage. Developer will be responsible for all coordination with applicable Government Entities, major stakeholders and adjacent land owners as required for this Option 1 Work.

In the event that Option 1 is not utilized, Developer will restore connectivity to the local streets along the existing US 181 alignment from I-37 to Harbor Drive; including Belden Street, Brewster Street, Port Avenue, Harbor Drive and North Broadway Street.

1.3.1.2 Option 2 Work

Option 2 Work includes the transition of I-37 to an Arterial from the SH 286/US 181 Interchange to Mesquite Street. The scope of Option 2 Work includes the design and construction of I-37 as a 6-lane divided at-grade thoroughfare with a typical section as shown in Attachment 1-3. This Option 2 would include the removal of the Staples Street overpasses in favor of an at-grade crossing; and would meet or exceed existing north-south connectivity. This Option 2 would include the removal of the Alameda Street pedestrian crossing in favor of an at grade Shared Use Path crossing adjacent to the Staples Street crossing. This work includes all applicable pavement, drainage, curb & gutter, sidewalks, ADA ramps, grading, lighting, signals, striping and signage. Developer will be responsible for all coordination with applicable Government Entities, major stakeholders and adjacent land owners as required for this Option 2 Work. The Option 2 work shall compliment the concepts shown in the Corpus Christi Regional/Urban Design Assistance Team provided in the RID to enhance the nature and character of a proposed urban center concept in the 'SEA' District of Corpus Christi.

2 PROJECT MANAGEMENT

Developer shall establish and maintain an organization that effectively manages the Work. Developer's project management effort shall be defined by and follow Developer's Project Management Plan (PMP), a collection of several management plan elements (PMP Elements) as described in Table 2-1 below. The PMP is an umbrella document that describes Developer's managerial approach, strategy, and quality procedures to design and construct the Project and achieve all requirements of the Contract Documents. The PMP shall include language to allow and support the conducting of external audits of the PMP for compliance by TxDOT or any of its representatives.

Table 2-1: Elements of the Project Management Plan

Chapter Title	Section of Technical Provisions That Defines the Chapter Requirements
Project Administration	Section 2
Quality Management Plan • **Professional Services Quality Management** • **Construction Quality Management** • **Maintenance Management**	Sections 2 and 19
Comprehensive Environmental Protection Plan	Section 4
Safety and Health Plan	Section 2
TxDOT – Developer Communications Plan	Section 2
Public Information and Communications Plan	Section 3
Right of Way Acquisition Plan	Section 7
Risk Management Plan	Section 2
Sustainability Plan	Section 2

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

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

2.1 Administrative Requirements

2.1.1 Project Schedule

2.1.1.1 General Requirements

Developer shall develop a Project Schedule that defines the timeframe for completion of the Project and achievement of milestones, and shall use such Project Schedule to monitor progress and denote changes that occur during design and construction of the Project, as applicable, as well as to determine the amount of each progress payment due to Developer subject to a cap on payments shown in the Maximum D&C Payment Schedule.

Before the commencement of any Schedule Activity, Developer shall submit to TxDOT for review and Approval a Project Baseline Schedule (PBS) in accordance with the Work Breakdown Structure (WBS) described in Attachment 2-2, Work Breakdown Structure Requirements. Developer shall undertake and complete the planning, design, construction, and completion of the Work in accordance with the most recent Project Schedule Approved by TxDOT.

The scheduling software employed by Developer shall be compatible with the current and any future scheduling software employed by TxDOT (currently Primavera 6.2). Compatible shall mean that TxDOT may load or import, as applicable, any Developer-provided electronic file version of a schedule using TxDOT's scheduling software without modifications, preparation, or adjustments to such software to do so.

2.1.1.2 Project Baseline Schedule (PBS)

2.1.1.2.1 General

Developer shall use the Preliminary Project Baseline Schedule (PBS-1) submitted with the Proposal as a foundation to prepare a PBS and shall submit the Project Baseline Schedule (PBS-2) to TxDOT for review and Approval. Developer shall submit the PBS-2 to TxDOT, 30 days prior to NTP2 to allow for adequate TxDOT review. Approval of the Project Baseline Schedule (PBS-2) shall be a condition of NTP2. TxDOT will review the PBS within15 Business Days of submission. In the event that TxDOT does not accept the PBS, Developer shall revise and resubmit it with changes clearly identified. TxDOT will review each resubmission of the PBS within 10 Business Days of resubmission. Developer shall progress and update the PBS through schedule updates until a subsequent version of the PBS is approved by TxDOT.

Developer shall submit a hardcopy of the PBS on full-size (11" x 17") color plot sheets, as well as an electronic version of the schedule in its native format for each submittal along with the Project Schedule narrative.

Developer is solely responsible for planning and executing the Work; TxDOT's Approval of the PBS does not:

- Imply Approval of any construction methods or relieve Developer's responsibility to provide sufficient materials, equipment, and labor to guarantee completion of the Project in accordance with the Contract Documents.
- Attest to the validity of assumptions, activities, relationships, sequences or any other aspect of the PBS.

Failure of Developer to include any element of the Work required by the Contract Documents in the approved PBS does not relieve Developer of the responsibility to perform such Work.

2.1.1.2.2 Project Baseline Schedule Overview

Developer shall develop and implement the PBS in the following stages:

a) PBS-1: Preliminary Project Baseline Schedule submitted with Developer's Proposal.

b) PBS-2: Developer shall use the Preliminary Project Baseline Schedule (PBS-1) as a foundation to prepare PBS-2 and shall submit the PBS-2 to TxDOT for review and Approval in advance of NTP2, as indicated in 2.1.1.2.1. PBS-2 shall reflect the intended execution plan meeting all schedule requirements. Developer shall incorporate the Final Design elements into the PBS-2 schedule updates as Release for Construction Documents (RFC) plans are completed. Activity quantities related to Schedule of Value costs shall be based upon Developer's proposed design. The data date for PBS-2 shall be the date of NTP1. Developer shall progress and update the approved PBS-2 monthly until a subsequent version is reviewed and approved.

c) PBS-3: Developer shall submit PBS-3 to TxDOT on or before six (6) months after NTP2 and shall reflect all Final Design elements to date, final quantity assessment for each scheduled construction activity, the updated plan and completed Schedule of Values reflecting Final Design. Developer shall update PBS-3 monthly until a subsequent revision (PBS-3+) is reviewed and approved or the Substantial Completion Deadline, whichever is earlier.

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

Developer shall include a separate narrative report with each PBS which describes the general sequence of design and construction, the proposed Critical Path and all Completion Deadlines.

Developer shall develop the PBS in accordance with the WBS, the minimum requirements of which are included in Attachment 2-2 and the resource and cost loading requirements set forth in Table 2-2, and submit the PBS to TxDOT for review and Approval. Developer shall map each Schedule Activity described in the PBS to one of the WBS levels and describe each segment of the Work to the same level of detail. At a minimum for reporting Project costs, Developer shall utilize the organizational structure included in Attachment 2-3, Organizational Structure for Cost Reporting.

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

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

[1]Or as otherwise approved by TxDOT.

[2]For the purposes of this Table 2-2, level 4 shall signify the fourth level on Attachment 2-2. Ex: 1.X.X.X.

[3]For the purposes of this Table 2-2, level 5 shall signify the fourth level on Attachment 2-2. Ex: 1.X.X.X.X.

2.1.1.2.3 Project Baseline Schedule Requirements

Developer shall define a complete and logical plan that can realistically be accomplished for executing the Work and the PBS shall reflect such plan. The PBS shall:

a) Reflect the proposed approach to accomplish the Work;

b) Include all major activities of Work required by the Contract Documents and also include activities for property acquisitions, Utility Adjustments, permit acquisitions, and interfaces with other projects and Governmental Entities;

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

d) Include a listing of all Submittals and submittal activity durations including specific durations for TxDOT review and/or Approval of Developer's Submittals.

2.1.1.2.4 Project Baseline Schedule Coding

Developer shall utilize an activity coding structure for the PBS that allows project activities to be sorted by type of work and location of work, or as mutually agreed to by Developer and TxDOT. Developer shall assign each activity an activity code for each Work element to indicate the type of work related to the activity. Activity codes shall be global code values and shall be as indicated in Table 2-3 below.

Table 2-3: "Type of Work" Code Values

Code Value	Description
AGGREGATE	Granular Base
CLEAR&GRUB	Clear and Grub, Removal
DEMO	Building demolition, other
DESIGN	Design, studies, RFC package deliverables
DRAINAGE	Pipe, Box Culvert, Headwall
EXCAVATION	Cut, fill, excavate
FLATWORK	Curb, gutter, sidewalks
LANDSCAPE	Topsoil, mulch, seeding
MOT	Maintenance of Traffic
PAVING	Concrete, Asphalt, etc.
PROCURE	Procurement of materials
ROW	Right-of-Way
SIGNALS	Signals, foundations, poles
SIGNING	Signing - Permanent
STRIPING	Striping - Permanent
SUBSTRUCTURE	Foundation, Columns, Bent, Piles, Abutments (bridge)
SUPERSTRUCTURE	Girders, Deck, Approach Slabs, Parapet, Polymer Overlay (bridge)
SURCHARGE	Consolidation and Settlement Times
TRAIL	Trails - Pedestrian and Bike
UTILITY-COMM	Utility Communication
UTILITY-GAS	Utility Gas
UTILITY-POWER	Utility Power
UTILITY-WATER	Utility Water/Irrigation/Sewer
UTILITY-OTHER	Other Miscellaneous Utilities
WALLS	Noise, MSE, Retaining
NA	Not Applicable – Not on Mainlane, Misc., LOE, and other programmatic activities not categorized by Type of Work code

2.1.1.2.5 Work Breakdown Structure

Developer shall organize the PBS in a manner consistent with the WBS. Developer may add WBS elements and/or levels to those presented in Attachment 2-2 with TxDOT's written Approval. Developer shall further develop and detail the initial WBS in accordance with its specific Schedule Activities and retain the ability to summarize to at least the same level as shown in Attachment 2-2 or as approved by TxDOT. Developer shall assign the WBS structure consistently and uniformly among all similar activity types and shall develop the WBS with clearly identifiable linkages to the Schedule of Values and Schedule Activities.

2.1.1.2.6 Calendars

Developer shall define calendars as follows:

a) TxDOT holidays are non-work days.

b) Project calendar descriptions shall begin with a unique project identifier.

c) The application of "Standard" Primavera calendars is not acceptable.

d) Potential non-work weather days are identified and included in each calendar's work month.

e) Adequately represent non-work days associated with limitations (such as paving seasons, utility shutdown seasons, landscaping seasons).

f) A 7-day calendar to be utilized for cure, settlement, and other activities as appropriate is included.

g) Project calendars are assigned consistently among similar activity types.

2.1.1.2.7 Milestones/Constraints

Developer shall separately identify each Completion Deadline, conform such Completion Deadline to the scheduling requirements set forth in the PBS, and assign a "finish no later than" constraint date to such Completion Deadline. Developer shall include additional milestones in the PBS to define significant events such as NTPs, start and finish of major segments/areas/regions of work, major traffic changes and coordination points with outside entities, such as Utilities.

The PBS shall not contain any constrained activities, other than contract milestones, without TxDOT Approval. Utilization of constraints following the PBS-2 Approval will be allowed only with TxDOT Approval.

2.1.1.2.8 Activities

Developer shall describe activities with a unique and logical activity description to easily identify the specific activity so that the scope of work is identifiable and progress on each activity can be measured. Each activity description shall indicate its associated scope and location of work such as type of work, bridge number, station to station locations, side of highway, or pipe number, and shall include a verb in the activity description to indicate the action undertaken such as install, place, or fabricate. Developer shall create Schedule Activities so that the Work is broken down into similar manageable Work elements with greater detail added as the schedule progresses from PBS-1 to PBS-3 (for example, Developer shall break down bridges minimally into foundations, substructure, superstructure, and deck for PBS-3.).

Developer shall define the duration of each activity and shall limit the maximum duration according to Table 2-2 unless otherwise approved by TxDOT. Exceptions could include non-work type activities such as mobilization, design, fabrication, settlement durations, curing and long lead procurement items. The duration for each activity shall be the time required to complete the Work based on the quantity of Work divided by reasonably anticipated production rates when applicable. Developer shall include separate activities for cure time, major inspection points requiring preparation, Submittal periods, Environmental Approvals and other time-consuming activities.

Developer shall clearly identify the relationships and logic that tie activities together. Each activity is to have at least one predecessor and one successor activity, except for NTP1 and Substantial Completion milestones. Unnecessary relationships or excessive ties to end milestones shall be avoided.

2.1.1.2.9 Miscellaneous

In developing schedules, Developer shall use schedule software settings similar to Primavera schedule software settings, if not using Primavera, as follows:

a) *Define critical activities as Longest Path* schedule option setting in lieu of *Total Float Less Than or Equal To* 2 days.

b) *Retained Logic* schedule option setting to calculate the Critical Path and controlling activities in the PBS and subsequent schedule updates.

c) Highlight Critical Path in red on all schedules to distinguish critical Schedule Activities from other Schedule Activities and Float shown for all Schedule Activities.

d) Use *Leveling Resources* schedule option only with prior notification to and concurrence of schedule update procedures by TxDOT.

Developer shall cost-load the PBS as follows:

a) Provide a sufficient number of activities so that the budget of any one activity does not exceed $1.0 million in the PBS-3 schedule, unless otherwise approved by TxDOT.

b) Allocate the total dollar amount that represents all of the Work that is reimbursable under Federal Law by the Price throughout the payment activities in the PBS. Such allocation shall not artificially inflate, imbalance, or front-load line items.

c) Developer shall prorate its indirect costs such as project management, administration, contingencies, site cleanup and maintenance and security costs related to design-build costs through all payment activities.

Developer shall revise the cost loading during the course of the Project in Project Baseline Schedule Updates if it becomes necessary to add, combine, eliminate, or modify payment activities or Schedule Activities to reflect modifications to the Work due to an executed Change Order. Developer shall add into the schedule Change Orders as they are approved by TxDOT with appropriate activities, resources, and units/budget to represent the modified scope of work. Developer shall include a WBS level for each executed Change Order under the "Change Modification" level of the cost breakdown structure (Attachment 2-3). Developer shall map all costs, if applicable, to the Change Order WBS level accordingly.

If applicable, Developer shall request revisions to the PBS and consequent realignment of funds between payment activities through Potential Change Order (PCO) notices. The total cost in the schedule shall match the total Project cost inclusive of all approved Change Orders. As activities are added or split out in the course of revising a schedule update, units/budget for those activities shall also be re-allocated to represent the appropriate quantity to accomplish the Work within the activity duration.

Developer shall incorporate all executed Change Orders into the originally planned execution of the Work and submit to TxDOT a revised PBS within 10 Business Days after each Change Order is executed.

2.1.1.2.10 Float

Developer shall not sequester total project Float through manipulating calendars, extending activities durations or any other such methodology. Float suppression techniques, negative Float, and Schedule Activity durations, logic ties, and/or sequences deemed unreasonable by TxDOT shall not be used. Float shall not be for the exclusive use of or benefit of either TxDOT or Developer but shall be a jointly owned, expiring resource available to the Project. Float shall not be used to the financial detriment of either party. Any schedule, including the PBS and all updates thereto, showing an early Substantial Completion date shall show the time between the scheduled Substantial Completion date and the applicable Completion Deadline as the total Float of the Project.

2.1.1.2.11 Schedule of Values

Concurrent with the PBS, Developer shall submit to TxDOT a complete Schedule of Values for all payment activities for TxDOT's Approval. TxDOT's Approval of the Schedule of Values is a condition of NTP2. If applicable, no payment by TxDOT will be made until the Schedule of Values is approved by TxDOT.

Pertaining to the presentation of the Schedule of Values:

a) Developer shall organize and group payment activities according to the approved WBS with subtotals for each WBS item at each WBS level. There can be one or more payment activity for each of the lowest (terminal) WBS elements in the WBS. For example, earthwork could have one payment activity or multiple payment activities that roll up costs to the WBS Level element.

b) Each payment activity from the PBS shall contain a unique identification number, the activity description, the quantity, the applicable unit, the unit price and scheduled cost value.

The Schedule of Values shall contain separate activities for temporary roads for access, off-site access roads, Project clean-up as well as planned maintenance, as applicable, to capture budgeted costs. Developer shall prorate its Project management, administration, QA/QC, contingencies and any allowance for inflation, profit and financing, as well as site security through all payment activities so that the sum of all the Schedule of Values line items equals the total Project cost.

If it becomes necessary to add, combine, eliminate or modify any payment activities due to changes in the Work, Developer shall submit a revised Schedule of Values as derived from a revised PBS within 10 Business Days after the respective Change Order is executed. TxDOT will review the Submittal and within 15 Business Days of submission, return it to Developer as approved or returned for resubmission within 5 Business Days from the date of receipt by Developer. Developer shall repeat the Submittal process until receiving TxDOT Approval of the Submittal.

2.1.1.2.12 Progress Report

Each month, beginning with the first full month after NTP2, Developer shall submit to TxDOT the Progress Report. Developer shall submit the Progress Report by close of business within seven days following prior month's end. Developer shall submit an electronic and printed copy of the entire Progress Report to TxDOT.

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

a) Description of progress for each section and the Project as a whole, including all phases of Work. Identify start date and completion dates on major areas of Work. Group the information based on the WBS.
b) Summary QA/QC, and audit findings, including demonstration of fulfillment of audit schedule.
c) Listing of any Change Orders that were identified or executed during the period from the submission of the previous month's Progress Report to the submission of the current Progress Report. Include their status.
d) Identification of Schedule Activities planned for the upcoming period.
e) Identification of problems and issues that arose during the period from the submission of the previous month's Progress Report to the submission of the current Progress Report and issues that remain to be resolved.
f) Summary of resolution of problems/issues raised in previous Progress Reports or resolved during the period from the submission of the previous month's Progress Report to the submission of the current Progress Report.
g) Identification of Critical Path issues and proposed resolution.
h) A report on the Completion Deadlines showing the schedule dates for the immediate prior month and current month. A narrative is required to explain why the dates have changed for variances greater than thirty (30) days.
i) A monthly expenditure projection curve for the total Project.
j) Identification of requested and/or required TxDOT actions for the next month.

k) Digital progress photographs that accurately depict Project progress as outlined in the Progress Report narrative.

2.1.1.2.13 Project Baseline Schedule Narrative

Developer shall provide a schedule narrative with PBS-2 and subsequent PBS submittals. In developing the schedule narrative, Developer shall:

a) Describe the construction philosophy supporting the Work plan and approach to the Work outlined in the PBS.

b) Describe the approach used to apply relationships between activities, such as physical or chronological relationships between Work activities, sequencing due to crew or equipment resources, or timing of Work based on limitations (such as ROW, environmental, Utilities).

c) Describe any limited resources, potential conflicts, or other salient items that may affect the schedule and how they will be resolved.

d) Describe the Critical Path and identify challenges that may arise associated with the Critical Path.

e) Describe adverse weather sources and calculations used for assumptions in determining potential non-work weather days.

f) Describe activity coding structures and how they will be used.

g) Provide a list of planned resources describing crews, crew size, major equipment, and production rates. The work force listing shall include only planned resources available to Developer.

h) Provide a list of applicable activities and justification for usage of:

- Activities with durations exceeding 20 days
- Constraints
- Unusual calendars
- Assumptions and calculations for non-work weather days added to calendars
- Lag

Along with the schedule narrative, Developer shall include layouts, in PDF format, generated from the scheduling software to illustrate the following:

- Developer's approach to Work (based on WBS or other applicable coding) including, at a minimum, columns for activity ID, activity name, start, finish, original duration, remaining duration, total Float, longest path, budgeted cost, and Gantt chart;
- Longest path layout; and
- Other layouts or reports as agreed upon with TxDOT.

2.1.1.2.14 Project Baseline Schedule Submission

Developer shall establish a sequential numbering system for schedule Submittals and associated reports to allow easy identification of PBSs, schedule updates and re-submissions. All schedules, charts and diagrams shall display the Project title, the data date and a legend indicating the various symbols used and their meanings. Developer shall provide the following for each schedule Submittal:

a) One electronic copy in native software of the schedule;

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

c) One electronic copy in PDF format of layouts as generated from the scheduling software.

TxDOT will review the schedule Submittal and within 10 Business Days of submission, return it to Developer as approved, approved with comments to be addressed in the following schedule update, or returned for resubmission within 10 Business Days from the date of receipt by Developer. Developer shall repeat the Submittal process until receiving TxDOT Approval of the Submittal.

2.1.1.3 Project Baseline Schedule Updates

2.1.1.3.1 Project Baseline Schedule Update Requirements

Developer shall provide schedule updates that comply with all PBS requirements. Data dates for schedule updates shall be the day after the progress period closes. No changes in activity durations, calendar assignments, logic ties, or constraints will be allowed without TxDOT's written Approval. Developer shall show actual progress for each activity in the schedule updates such as:

a) Actual start and finish dates for completed activities;

b) Actual start dates, physical percent complete and remaining duration for activities in progress;

c) Projected sequences of activities for future Work;

d) Revised relationships and durations for unfinished activities, if warranted; and

e) A well-defined Critical Path.

For each schedule update, Developer shall ensure that:

a) Planned budget values match total Project cost or revised total Project cost inclusive of all authorized Change Orders; and

b) All planning changes, adjustments, or revisions in sequencing and timing of the remaining Work are accurately represented.

If Work is performed out of sequence, Developer is required to implement logic changes consistent with the retained logic method of scheduling to allow the out-of-sequence Work to proceed.

Through schedule updates, Developer may demonstrate proposed modifications to planned Work that require adding or deleting activities, changing activity descriptions, or revising activity durations or logic that are consistent with the following requirements:

a) No changes are to disrupt the integrity or comparative relationship between current and previously approved PBSs or schedule updates;

b) An activity ID can only be used once (i.e., do not delete an activity then create a new activity at a later date utilizing the same activity ID);

c) Activity descriptions may be revised for clarification, but are not to be altered to represent a different scope than originally intended. For example, an earthwork activity may be further defined by adding station limits but the description cannot be changed to concrete paving with related logic ties; and

d) If changes impacting the Critical Path result in an extension of the Substantial Completion Deadline, beyond contractual limits, Developer shall be required to submit a time impact analysis.

2.1.1.3.2 Project Baseline Schedule Update Narrative

Developer shall provide a narrative with each schedule update Submittal. In developing the narrative for the schedule update, Developer shall:

a) Describe the Work performed during the progress period. Describe progress for each segment/section and the Project as a whole, including all phases of Work and interim milestones organized and reported by the defined WBS;

b) Provide a summary of QA/QC issues that can potentially affect the Critical Path of the CPM model;

c) Explain deviations between the Work planned and the Work performed for the period;

d) Describe the Work to be accomplished during the next period;

e) Describe the current Critical Path of the Project, explaining any changes since the previous update as well as potential issues and proposed resolutions;

f) Explain significant changes to the schedule since the previous update;

- Provide the reason or justification for the changes, and
- Describe any resulting affects or impacts to the Project Schedule. Particular focus should be on any changes that affect Critical Path or near-Critical Paths.
- Explain changes to:
  - Calendar
  - Activity unit/budget allocations
  - Planned resource (crew) allocations that deviate from the baseline work plan
  - Critical Path

g) Identify requested and/or required TxDOT actions, if applicable, for the next month;

h) Provide the status on pending items applicable to the schedule such as:

- Permits, easements, agreements
- Contract changes or time adjustments
- Change Orders that were executed during the period from the submission of the previous month's Progress Report to the submission of the current Progress Report
- Time impact analyses

i) Describe current and anticipated problems or delays including:

- List current/anticipated problems and/or delays with cause and effect on Work, milestones and completion dates. A summary of the resolutions (status) to the problems and/or delays listed above (resolved, ongoing or anticipated).
- Plans for mitigating or resolving ongoing and/or anticipated problems and/or delays.
- Actions TxDOT needs to take and required timeline for actions to avoid or mitigate the problem.

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

If any actual dates are changed or corrected in any subsequent month, Developer shall submit a separate narrative with the schedule update providing an explanation of the change.

Along with the schedule update narrative, Developer shall include layouts, in PDF format, generated from the scheduling software to illustrate the following:

a) Layout to demonstrate Developer's approach and progress of work based on WBS or other applicable coding. At a minimum include columns for activity ID, activity name, start, finish, original duration, remaining duration, total Float, budgeted cost, and Gantt chart. The Gantt chart shall contain current planned bars and baseline /target bars that represent the previous period's progress forecast;

b) Longest path (i.e., Critical Path) layout organized by WBS and sorted by early start;

c) A 90-day look ahead Gantt chart showing all upcoming Submittals from Developer and Approvals required by TxDOT or other Governmental Entities;

d) A 90-day look ahead Gantt chart grouped by WBS and sorted by early start date;

e) Graphical report which compares Developer's actual monthly progress to the previous month's planned progress, organized by WBS;

f) A 90-day look ahead Gantt chart of Design document Submittals for the forthcoming period;

g) Monthly expenditure projections and cash expenditure curves by WBS or as requested by TxDOT, if applicable; and

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

Progress payment requests, if applicable, shall accompany the schedule update narrative.

In addition to the schedule update narrative, Developer shall provide a separate report on the Completion Deadlines showing the schedule dates for the immediate prior month and the current month. For variances greater than 30 Days, Developer shall include a narrative to explain why the dates have changed.

2.1.1.4 Project Baseline Schedule Update Submission

Developer shall submit to TxDOT the schedule update, narrative and agreed upon layouts or reports each month during the Term beginning with the first full month after NTP2. Developer shall provide the following for each schedule update Submittal:

a) One electronic copy in native software of the schedule file;

b) One electronic copy in PDF format of narrative report;

c) One electronic copy in PDF format of, agreed upon, layouts/reports as generated from the scheduling software; and

d) The project narrative as described in Section 2.1.1.3.2 above.

TxDOT will review schedule updates for consistency with Developer's WBS and the currently approved PBS and for conformance with the Contract Documents. TxDOT will return the schedule updates to Developer as approved, approved with comments to be addressed in the following schedule update, or not approved with comments to be incorporated for resubmission within 10 Business Days of receipt by Developer. The Submittal process shall be repeated until receiving TxDOT Approval of the Submittal.

2.1.1.5 As-Built Schedule

Upon completion of the Punch List, Developer shall submit the schedule update identified as the "as-built schedule". The as-built schedule shall reflect the exact manner in which the Work up to Final Acceptance, as described by the Contract Documents, was actually performed including start and completion dates, Schedule Activities, actual durations, sequences and logic.

2.1.1.6 Time Impact Analysis

Developer shall submit to TxDOT a written time impact analysis (TIA) in each of the following situations:

a) As part of a PCO notice based on a delay as set forth in the Contract Documents.

b) If any changes in a schedule update impact the Critical Path, such that they create an extension of the Substantial Completion date beyond the Substantial Completion Deadline.

c) If Developer has claim for delay. Developer shall submit a separate TIA for each delay event.

TxDOT may request, at any time, a TIA demonstrating impact or potential impact to the schedule resulting from claimed delays or Change Orders that are being negotiated between TxDOT and Developer. If TxDOT requests a TIA, Developer shall submit the requested TIA within 15 Business Days of receiving the request. TxDOT will return the TIA to Developer as approved or not approved with comments to be incorporated for resubmission within 5 Business Days of receipt by Developer. The Submittal process shall be repeated until receiving TxDOT Approval of the Submittal.

Submission of a TIA does not relieve Developer of complying with all contractual requirements regarding notification and documentation of potential Change Orders.

Time extensions will only be considered if:

a) The delay event is demonstrated to affect the controlling operation on the Critical Path. Changes that do not affect the Critical Path will not be considered as the basis for a time adjustment.

b) The total Float is absorbed and the scheduled Completion Deadline is delayed one or more Business Days because of the change or impact.

c) In the case of multiple lines of negative Float, the change or delay must cause the affected path to exceed all others before a time extension will be granted.

Each TIA submitted by Developer shall consist of the following steps or elements:

a) Establish the status of the Project before the impact by using the most recent schedule update that has the closest data date prior to the event for TIA, or as adjusted by mutual agreement.

b) Identify the impact event, estimate duration of the impact, determine appropriate logic, and insert the impact activity or fragnet of activities into the schedule.

c) Demonstrate any resulting effects from the impact through layouts generated from the scheduling software. Filter activities to show added or modified activities and activities impacted from changes. Note any other changes made to the schedule including modifications to the calendars or constraints.

d) If the current Project baseline schedule update is revised subsequent to Submittal of a TIA but prior to its acceptance, promptly indicate, in writing, to TxDOT the need for any modification to its TIA.

Developer shall submit the following with each TIA Submittal:

a) A narrative report which:

- Identifies the schedule update(s) used for analysis.
- Describes the procedures used to analyze schedule impacts, including:
  - Additions, deletions, or modification to activities and/or fragnets
  - Modifications to the calendars or constraints
  - Modifications to relationships
- Describes the impact or potential impact by comparing Work prior to the impact and Work affected or predicted to be affected after the impact.
- Describes mitigation efforts taken to date.
- Describes potential resolutions to mitigate or avoid impact.

b) Schedule layouts in PDF file format. Filter activities to clearly show impacted activities and effects to the Critical Path. Multiple layouts may be required to adequately demonstrate the impact to the Critical Path. At a minimum, provide a layout demonstrating associated activities prior to the impact and a layout demonstrating associated activities after the impact is inserted in the schedule and the schedule is progressed.

c) One electronic copy in native software of the impacted PBS.

d) Other information or documentation pertinent to the analysis.

Incorporation of TIA activities into the current schedule update Submittal requires TxDOT Approval.

2.1.1.7 Recovery Schedule

When required in accordance with Section 4.5 of the Agreement, Developer shall prepare a Recovery Schedule demonstrating the proposed plan to regain lost schedule progress and to achieve Final Acceptance of the last Project segment by the specified date and shall submit this recovery schedule with the subsequent schedule update.

If the PBS-3+ schedule performance index values of the Project construction scope falls below 0.65 with negative trending for four consecutive update periods, TxDOT has the option of requiring Developer to resource load the remaining construction activities and perform a resource analysis of the required work force. If required, Developer shall incorporate resources into the PBS per the following requirements:

a) Provide a list of crews with associated labor and equipment resources to TxDOT with the schedule Submittal.

b) Define crews as a labor resource type and assign to appropriate activities.

c) Provide TxDOT with a definition, the composition of and production rate for each crew type.

d) Do not include any costs for labor resources and do not calculate cost from units (price/unit =$0.00).

e) The "quantity" assigned to each activity shall represent the estimated efforts in place for the Schedule Activity value.

2.1.2 Document Management

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

2.1.2.1 Document Storage and Retrieval Requirements

Developer shall establish and maintain an Electronic Document Management System (EDMS) to store, catalog, and retrieve all Project records using the applicable control section job (CSJ) numbers. Unless otherwise directed by TxDOT, record retention shall comply with the requirements of the *Texas State Records Retention Schedule*, and Developer shall provide all Project records to TxDOT at the time of the expiration or earlier termination of the Agreement.

Maintenance records shall utilize the same format as TxDOT utilizes for its statewide asset inventory and condition assessments and shall be capable of being integrated into TxDOT's maintenance management systems as further described in Section 19.6.9.

Construction quality acceptance test results shall be automatically transmitted to TxDOT's I2MS system using TxDOT's extensible markup language (XML) web service. A sample is shown in Attachment 2-4, I2MS Test Form Fields. Developer shall coordinate with TxDOT to obtain the most current version prior to commencing construction quality acceptance testing. The responsible technician and his/her supervisor shall sign the daily test reports and Developer shall provide the results of the daily tests to TxDOT within 24 hours after test completion.

In the provision of a document management system, Developer shall:

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

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

c) Employ appropriate standards and procedures, and train Developer personnel to operate any TxDOT data management system which TxDOT may require in connection with the Project.

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

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

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

2.2 Quality Management Plan

Developer shall submit to TxDOT for Approval a comprehensive Quality Management Plan (QMP) that is consistent with and expands upon the preliminary QMP submitted with the Proposal. The QMP shall comply with ISO 9001 Quality Management Systems – Requirements, current version at the time of RFP, as updated by the International Organization for Standardization. Developer may elect to obtain formal ISO 9001 certification, but will not be required to do so.

The QMP shall be supported by the Professional Services Quality Management Plan, the Construction Quality Management Plan and the Maintenance Management Plan. These distinct plans shall be coordinated with one another such that common quality management system requirements such as Document Control, Process Auditing, and Corrective and Preventive Action can be addressed with a single approach.

2.2.1 General Requirements

Developer shall develop, implement, and maintain the QMP for the Term. The QMP shall describe the system, policies, and procedures that ensure the Work meets the requirements of the Contract Documents and provides documented evidence of same, while fulfilling the requirements of ISO 9001.

The QMP shall encompass all Work performed by Developer and Subcontractors of all tiers and shall contain detailed procedures for Developer's quality control and quality assurance activities. Developer's quality process shall incorporate planned and systematic verifications and audits undertaken by an independent party. Developer shall conduct all quality control, quality assurance, performance verification, and design overlay and coordination among design disciplines, all in accordance with the QMP and the requirements of the Contract Documents.

Developer shall make all quality records immediately available to TxDOT for review and shall provide TxDOT with a copy of any and all quality records when requested.

Developer shall submit to TxDOT the results of all internal audits, including any resulting corrective or preventive action requests, within seven Days of their completion and shall promptly submit to TxDOT non-conformance reports both upon issuance and resolution.

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

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

2.2.2 Quality Terminology

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

a) Organization: Developer's organization, including any Affiliates and contractors.

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

c) Product: The Work.

2.2.3 Quality Management Organization

Developer shall regularly maintain the QMP to contain current versions of the following information:

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

b) Description of the roles and responsibilities of all quality management personnel and those who have the authority to stop Work.

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

d) Resumes for all quality management personnel.

2.2.4 Quality Policy

The QMP shall contain a complete description of the quality policy and objectives that Developer will implement throughout its organization. The policy shall demonstrate Developer senior management's commitment to implement and continually improve the quality management system for the Work. The quality policy and Objectives shall be specific to the project and the Developer's quality commitment to TxDOT relative to that project. It shall not be a restatement of the quality policy of the Developer or one of its Affiliates.

2.2.5 Inspection and Testing

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

Developer shall revise and resubmit its QMP when its own quality management organization detects a systemic or fundamental non-conformance in the Work performed or in the manner the Work is inspected or tested, as a result of audits, or when TxDOT advises Developer of such a problem.

2.2.5.1 TxDOT Construction Notices

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

2.2.5.2 Reporting, Recordkeeping, and Documentation

Developer shall develop and maintain inspection and testing records, including:

a) Quality control inspection reports and process control material sampling/testing results and control charts, which Developer shall submit to TxDOT within 24 hours following the inspection or test.

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

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

d) The CQAF's inspection and materials quality program shall electronically deliver the laboratory and field test results to TxDOT in the database format provided in Attachment 2-4 within 72 hours. This electronic reporting is intended to allow Developer and TxDOT to make timely and accurate decisions on workmanship and material quality issues.

2.2.5.3 Laboratory Requirements

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

b) Developer shall ensure that equipment in all laboratories is certified prior to commencing any construction activities and shall retain the certification by AASHTO or TxDOT, as applicable, for the duration of the Work.

2.2.5.4 Supply Source and Material Quality

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

2.2.6 Responsibility and Authority of Developer Staff

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

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

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

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

2.2.7 Professional Services Quality Management Plan

Developer shall prepare and submit to TxDOT for review and Approval a Professional Services Quality Management Plan (PSQMP) that describes its policies, procedures, and staffing to manage design quality in accordance with the requirements of ISO 9001 and this Section 2.2.7. Developer shall submit the PSQMP to TxDOT for review and Approval in accordance with the timing requirements in Attachment 2-1. Note that the PSQMP shall be submitted in sufficient time to facilitate TxDOT review/comment and subsequent resolution/resubmittal prior to commencement of design.

2.2.7.1 Released for Construction Documents

Developer shall submit to TxDOT all Released for Construction (RFC) Documents in accordance with the Submittal requirements of the PSQMP. Developer's RFC Documents shall comply with the requirements of the Contract Documents, and shall be detailed, complete, constructible, and shall allow verification of the design criteria and compliance with Contract Documents.

Not later than two Business Days after Developer has completed design of any particular RFC Document, Developer shall submit the signed and sealed document to TxDOT.

Developer shall prepare and provide all Project-related Submittals and documents using English units of measure.

Developer shall furnish all Submittals by electronic copy in accordance with Section 2.1.1.4. Unless otherwise stated in the Contract Documents, Developer shall provide to TxDOT four hard copies and a single electronic copy of each Submittal. Each Submittal shall have the signature of an authorized representative of Developer, unless otherwise expressly stated for a particular Submittal. The electronic copy shall be in a suitable format (e.g., PDF) or in the format in which the Work was originally created unless stated otherwise in the Contract Documents.

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

The minimum sheet size for report Submittals shall be 8.5 inches by 11 inches. The minimum sheet size for design plan Submittals shall be 11 inches by 17 inches. The maximum sheet size for roll plot Submittals shall be 36 inches by 120 inches. Every page in a Submittal shall be numbered in sequence.

Developer shall ensure that each Submittal is full, complete, and assigned a unique, sequential number, clearly noted on the transmittal cover sheet. Developer shall assign original Submittals a unique numeric Submittal number and revised Submittals an alphanumeric designation which consists of the unique Submittal number assigned to the original Submittal followed by a letter of the alphabet to represent that it is a subsequent Submittal of the original.

Developer shall identify and note any changes made on a revised Submittal, other than those made or requested by TxDOT, on the revised Submittal.

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

a) Date of issuance and including all prior revision dates.

b) Contract title and number.

c) The names of Developer and applicable Affiliates.

d) Stage of development.

e) Reference to applicable technical documents and amendments.

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

g) Review stamp.

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

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

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

2.2.7.2 Record Drawings and Documentation

No later than ninety (90) Days before Final Acceptance of all or part of the Project, Developer shall submit to TxDOT a complete set of Record Drawings in hardcopy and native electronic format for the portion of the Project actually opened to traffic. The Record Drawings and documentation shall be an organized, complete record of Plans and supporting calculations and details that accurately represent what the Developer constructed.

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

2.2.7.3 PSQMP General Requirements

The PSQMP shall describe and include the general requirements in this Section 2.2.7.3.

Developer shall organize the quality control and quality assurance procedures for Professional Services products by discipline (such as structural, civil, Utilities). These procedures shall specify measures to ensure that appropriate quality requirements are specified and included in the Professional Services product and to control deviations from such requirements.

Developer shall specify certain specific quality control and quality assurance procedures, including all required forms and checklists, for preparing, verifying, and checking all Professional Services products to ensure that they are independently checked and back-checked in accordance with generally accepted engineering practices in the State of Texas and the requirements of the Contract Documents. The checking of structural design shall include a set of independent calculations, performed by Developer's Design Firm for all structural elements. The PSQMP procedures shall also describe the processes used for intradisciplinary, interdisciplinary, constructability quality control reviews, and the resulting records of each.

Developer shall clearly identify the designer and checker on the face of all Final Design Documents. The PSQMP shall also include specific procedures for verifying the Professional Services product along with any computer programs being used for such purposes. Final Design Documents shall be stamped, signed, and dated by the engineer in responsible charge for that item, Element, or phase of the Work.

Developer shall describe the procedures for coordinating and performing quality control review of Professional Services performed by different individuals or firms working in the same area, in adjacent areas, or on related tasks to ensure that conflicts, omissions or misalignments do not occur between drawings or between the drawings and the specifications. This shall also include the coordination of the review, Approval, release, distribution and revision of documents involving such parties.

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

Developer shall establish the procedures for meeting documentation requirements; the filing of check prints and other design QC/QA records, design criteria, reports and notes, calculations, plans, specifications, schematics and supporting materials needed during the Final Design; and the specific responsibilities of personnel to satisfy these requirements. Developer shall maintain, organize and index all Design Documents and make copies available to TxDOT upon request.

The PSQMP shall describe the procedures and schedules for the Professional Services Quality Acceptance Manager to perform audits of the Design Firm's quality control procedures, and the corrective/preventive action process used to address audit findings, including associated records.

2.2.7.4 Personnel and Staffing

Professional Services Quality Acceptance Manager. Developer shall assign a Professional Services Quality Acceptance Manager (PSQAM) who shall be responsible for management of the quality control program for design, environmental, ROW, Utilities and survey. The PSQAM shall not be involved with direct scheduling or production activities; and shall report directly to the Lead Quality Manager. The PSQAM shall see that the methods and procedures contained in the approved PSQMP are implemented and followed by Developer design staff in the performance of the Work. The PSQAM shall be a Registered Professional Engineer.

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

Lead New Harbor Bridge Design Engineer. Developer shall assign a Lead New Harbor Bridge Design Engineer who shall be responsible for ensuring that the design of New Harbor Bridge is completed and design criteria requirements are met. The Lead New Harbor Bridge Design Engineer shall be the engineer of record for the design of the New Harbor Bridge Elements and shall be a Registered Professional Engineer.

Lead Roadway Bridge Design Engineer. Developer shall assign a Lead Roadway Bridge Design Engineer who shall be responsible for ensuring that the design of the roadway bridges is completed and design criteria requirements are met. The Lead Roadway Bridge Design Engineer shall be the engineer of record for the design of the roadway bridge Elements and shall be a Registered Professional Engineer.

Lead Drainage Engineer. Developer shall assign a Lead Drainage Engineer who shall be responsible for ensuring that the drainage design is complete, design criteria requirements are met and the drainage system functions as designed. The Lead Drainage Engineer shall coordinate with the City of Corpus Christi Storm Water Department and TxDOT on drainage related items. The Lead Drainage Engineer shall be the engineer of record for the design of the drainage Elements and shall be a Registered Professional Engineer.

Personnel in Responsible Charge. In addition to the Key Personnel described in this Section 2.2.7.4, Developer shall designate (by name) the personnel in responsible charge for each item, Element, or phase of the Work. The personnel in responsible charge shall possess the necessary registrations in the State of Texas and shall be personally responsible for directly supervising the Work and who will stamp, sign and date the Professional Services product for a given item, Element, or phase of the Work as applicable.

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

2.2.7.5 Professional Services Submittal Review Process

Developer shall conduct a series of working meetings with its Professional Services staff, the internal quality control of Developer staff and TxDOT to establish workflow processes and procedures to be

utilized during the design review process that are consistent with the Contract Documents, these procedures shall be documented within the PSQMP. The working meetings are also to develop an understanding on general design concepts such as geometrics, aesthetics, drainage, traffic control, and structures.

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

The PSQAM shall chair the Submittal reviews with TxDOT and Developer shall maintain formal documentation of these meetings for TxDOT's audit, as further described in Section 2.2.7.5.2.

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

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

- Corridor Structure Type Study and Report Submittals
- Preliminary Bridge Layout Submittals
- Preliminary Design Submittal
- Final Design Submittal
- Any deliverables described in the Technical Provisions
- Exhibits Supporting Railroad Agreements
- Design Exceptions and Design Waiver Requests

2.2.7.5.1 Final Design Submittal

The PSQAM shall submit to TxDOT the Final Design Submittal for review along with a certification of compliance with each Submittal. Construction packages for individual Work items, Elements or phases shall be organized such that the final document package can be assembled in a manner similar to the standard construction documentation typically provided to TxDOT for conventional project letting, as mutually agreed upon by Developer and TxDOT.

When Developer has completed the Final Design Submittal for an item, Element, or phase and seeks to obtain TxDOT's concurrence of such a design, as further described in Section 2.2.7.7, the PSQAM shall certify that:

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

b) The design has been checked in accordance with Developer's approved PSQMP.

c) The item or Element is ready for construction.

d) Developer has obtained all required final ROW, Governmental Approvals, and Utility Owner Approvals.

The Final Design Submittal shall consist of complete Design Documents incorporating all of the design Submittal review comments provided in accordance with the Contract Documents. Developer shall provide all documentation, including copies of TxDOT's Approval of deviations for design standards and/or Design Exceptions to TxDOT with the Final Design Submittal.

Prior to certifying the above items, elements, or phases, and following review and comment of the Final Design Submittal by TxDOT, PSQAM shall have conducted a formal review with TxDOT as described in Section 2.2.7.5.2.

2.2.7.5.2 Formal Review

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

At least five Business Days prior to the applicable formal review presentation dates, Developer will assemble and submit drawings or other documents to TxDOT for information and review.

Draft minutes of formal review presentations shall be submitted to TxDOT by PSQAM within five Business Days after completion of each review.

2.2.7.6 Resubmittal Process

Resubmittals of any design Submittal may be required if deemed necessary by TxDOT or any Governmental Entities with jurisdiction over the Project. Developer shall address all comments received from a prior Submittal in a manner satisfactory to the commenting party for each Submittal. Developer shall resubmit Submittals as many times as necessary to address comments from TxDOT or any Governmental Entity with jurisdiction over the Project.

If TxDOT had requested additional information during the final formal review, PSQAM shall conduct an additional formal review of the resubmitted items, elements or phases. Developer shall concurrently provide to TxDOT a copy of all correspondence relating to each Submittal made to any Governmental Entity with jurisdiction over the Project.

2.2.7.7 Certification of Compliance

PSQAM shall verify that Developer obtained Approval from applicable Governmental Entities and Utility Owners prior to the issuance of a "Certification of Compliance" designation of the Design Documents by the PSQAM.

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

a) Design drawings

b) Design calculations

c) Design reports

d) Specifications

e) Electronic files

f) Documentation required for all Project ROW

g) Governmental Approvals

h) Utility Owner Approvals

TxDOT's concurrence with the PSQAM's "Certification of Compliance" will not constitute Approval of the design or subsequent construction, nor relieve Developer of its responsibility to meet the requirements hereof. Irrespective of whether TxDOT provides Developer with the authority to begin construction on items, Elements, or phases of the Work prior to completion of the design for the entire Project, Developer shall bear the responsibility to assure that construction meets the requirements of the Contract Documents, applicable Law and Governmental Approvals.

Construction on any item, Element or phase covered by the PSQAM's "Certification of Compliance" of said item, Element, or phase shall only progress to the extent covered by the Design Documents included in that statement except for the Work performed in accordance with Section 2.2.7.9 (Early Start of Construction). Prior to progressing further with construction of a certified package, Developer shall complete the next item, element or phase of design or complete the Final Design, and obtain TxDOT's concurrence, except for the Work performed in accordance with Section 2.2.7.9. Any items, elements or phases of design, subsequent to the "Certification of Compliance" from PSQAM, shall be checked and certified by the PSQAM in the same manner indicated above.

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

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

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

2.2.7.8 Design Changes

Developer or TxDOT may initiate design changes in accordance with this Section 2.2.7.8. Design changes may occur either on items, Elements, or phases undergoing construction or after Final Design. In order to process these types of changes, Developer shall submit, when the problem or change occurs, a Request for Information (RFI) for TxDOT's Approval.

All design changes shall undergo the same PSQMP checks as the original design.

The Engineer of Record responsible for the original design shall approve design changes during construction or design changes to Final Design Documents in writing. All plans, final Submittals, specifications, calculations, and reports for design changes shall be stamped, signed and dated by a Registered Professional Engineer. In all cases, the PSQAM shall certify in writing that the design change has been:

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

b) Checked in accordance with Developer's approved PSQMP, and

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

Developer shall request and schedule interim and final RFI formal design review(s) by TxDOT for all design changes made during construction or to the Final Design Documents. Developer shall document all changes in the Record Drawings.

2.2.7.9 Early Start of Construction

The following will set forth the circumstances under which certain items, Elements, or phases of the Work may be packaged by Developer to initiate an Early Start of Construction prior to obtaining TxDOT's concurrence of the Final Design for the item, Element or phase. The Early Start of Construction requirements shall apply to any Work that is performed by Developer prior to receiving TxDOT's written concurrence with the PSQAM's Certification of Compliance of the Final Design Submittal for the Work. All such Work is performed at the sole risk of Developer. TxDOT does not consider any items as satisfying the PSQMP requirements until the PSQAM has issued a certification of compliance and TxDOT has issued a written concurrence therewith.

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

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

TxDOT and Developer shall agree on procedures for Early Start of Construction, which shall then be documented within the PSQMP. These procedures shall among other things include a process for distributing Construction Documents signed and sealed by a Registered Professional Engineer to TxDOT and Developer's field staff. In order for Developer to proceed with early phases of construction of a portion of the Work, specific pertinent items of the design shall have been previously reviewed by TxDOT and comments from TxDOT shall have been transmitted to Developer. For example, Early Start of Construction may be rough grading of a specific portion of the Project, for which specific pertinent items of the design may include:

a) Horizontal and vertical drainage system

b) Typical sections

c) Related Elements of the drainage system

d) Related Elements of the traffic control plan specifically applicable during the term of the Early Start of Construction scope

e) Subsurface geotechnical investigations and recommendations

f) Slope stability analysis and recommendations

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

h) Settlement monitoring program

i) Construction specifications

An Early Start of Construction shall be at the sole and complete risk of Developer, and does not release Developer from any of the requirements described in Section 2.2.7. If, as a result of the review process, construction modification or changes to already completed Work elements performed under the Early Start of Construction are required, Developer shall make any and all construction modifications to already completed construction activities at its sole cost and expense without any entitlement to time extensions or adjustments in the Price.

2.2.8 Construction Quality Management Plan

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

Materials quality assurance for the project will be carried out in accordance with TxDOT's Quality Assurance Program (QAP) for Design-Build (D-B) Projects. Develop the project CQMP to meet the requirements of TxDOT's QAP for D-B. The CQAF will conduct materials sampling and testing in accordance with TxDOT's QAP for D-B and the results of those tests will be used as part of the acceptance decision, if the QCAF test results are validated by the Owner Verification sampling and testing, as described in TxDOT's QAP for D-B. CQAF test results that are not independently validated by owner verification sampling and testing will not be used to determine material acceptability. When QCAF test results are not validated by the owner verification sampling and testing, the material in question will be evaluated as described in section 3.5 of TxDOT's QAP for D-B.

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

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

b) Designation of an individual on each crew to be responsible for performing daily field inspections of their own Work and for preparing a daily QC report to document the inspection performed.

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

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

e) A construction quality control organization and staffing plan. Developer shall (a) show the period of time that the quality control staff member will be present on the Site; (b) include the resumes of the Key Personnel; and (c) state the experience/knowledge/skill levels of the quality control support staff.

f) CQAF organizational and staffing plans. Developer shall (a) show the period of time that the quality acceptance staff member will be present on the Site shall be shown; (b) include the resumes of key staff members; and (c) state the required minimum knowledge, technical skills, and experience level of the personnel related to the various inspection functions, such as grading, drainage, pile-driving and structures inspections, that will occur on the Work. Developer shall identify the administrative/clerical support staff for maintenance and management of records/documents pertinent to quality acceptance for the CQAF activities.

g) Procedures for inspecting, checking, and documenting the Work. Developer shall perform inspection, examinations and measurements for each operation of the Work to assure quality.

h) Sampling and testing requirements of all materials during the production or manufacturing processes.

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

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

k) Procedures to ensure that critical Elements of the Work are not started or continued without inspection and testing by the quality acceptance personnel on site. Developer shall identify and communicate inspection or hold points to the CQAF, Construction Quality Control Manager (CQCM), and TxDOT and develop procedures to proceed beyond inspection points.

l) Description of specific procedures to ensure that all Work conforms to the requirements of the Contract Documents, Governmental Approvals and applicable Laws, and the Design Documents, as well as that all materials, equipment, and Elements of the Work will perform satisfactorily for the purpose intended.

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

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

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

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

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

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

s) A program for inspection for each operation of all Work examinations, measurement and test of materials or Elements of the Work to assure quality.

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

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

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

v) Procedures for reviewing and approving acceptance test results, categorizing test results in a manner acceptable to TxDOT, transmitting acceptance test results to TxDOT in a format and in accordance with time requirements acceptable to TxDOT for use in fulfilling its statistical validation requirements, and working collaboratively with TxDOT and the Owner Verification Firm to resolve statistical non-validation between CQAF and TxDOT test results.

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

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

y) A corrective/preventive action process in order to investigate and determine the root cause of systemic, chronic, or process nonconformances; to develop and implement an action plan sufficient to prevent recurrence; and subsequent verification to ensure that actions were taken and effective.

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

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

bb) The requirements and methods for controlling documents. Developer's document control system shall be compatible with TxDOT's.

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

dd) The form and distribution of certificates of compliance.

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

2.2.8.1 Personnel and Staffing

2.2.8.1.1 Construction Quality Control Manager (CQCM)

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

2.2.8.1.2 Construction Quality Control Staff

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

2.2.8.1.3 Construction Quality Acceptance Manager (CQAM)

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

The CQAM shall review, approve, authorize, examine, interpret and confirm any methods or procedures requiring the "Engineers' review, Approval, authorization, examination, interpretation, confirmation, etc." which are contained in the TxDOT Standards Specifications. Under documented delegation by TxDOT, the CQAM may also exercise engineering judgment with respect to nonconforming material.

2.2.8.1.4 Construction Quality Acceptance Staff

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

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

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

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

2.2.8.1.5 Construction Quality Acceptance Staff Levels

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

Developer shall update the construction quality acceptance staffing requirements as necessary throughout the Construction Period and where applicable for Renewal Work during the O&M Period to reflect changes in the actual construction schedule. Developer shall ensure that adequate construction quality acceptance staff is available and that CQMP activities are undertaken in a manner consistent with the Project Schedule and in a manner that will enable Developer to achieve the Substantial Completion and Final Acceptance Deadlines.

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

2.2.9 Maintenance Management Plan

Section 19 (Maintenance) includes requirements for the Maintenance Management Plan, the O&M Work QMP and maintenance staffing requirements.

2.3 Comprehensive Environmental Protection Plan

Section 4 (Environmental) includes requirements for environmental management.

2.4 Public Information and Communications Plan

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

2.5 Safety and Health Plan

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

Developer shall be responsible for all Port security approvals, including but not limited to the Transportation Worker Indentification Credential (TWIC) card program.

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

a) Safety Management

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

- Roadway construction and safety enforcement experience;
- Ten years of progressive heavy construction experience, five years of which must be safety management experience on complex heavy civil projects;
- Designation, at or before the Effective Date, as a Construction Health and Safety Technician (CHST) by the Board of Certified Safety Professionals (BCSP), or designation as a Certified Safety and Health Official (CSHO), either of which may be substituted for two years of safety management experience;
- Completion of the OSHA #500 Trainer Course in OSHA Standards for Construction;
- Training and current certification for CPR and First Aid; and
- Completion of the following training sponsored by an accredited agency:
  - Work zone traffic control
  - Flaggers in work zones.

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

In addition, Developer's safety management team shall also have the minimum additional personnel. As part of Developer's safety and health management, during the Construction Period and whenever Renewal Work is being undertaken all Work shifts shall have, as a minimum, an on-Site Shift Safety Representative. The Shift Safety Representative shall have the following minimum qualifications:

- Three years of progressive safety experience and general competency in the construction safety disciplines related to the Work;
- Completion of the OSHA 10-hour Safety and Health Course; and
- Training and current certification for CPR and First Aid.

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

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

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

b) Worksite and Jobsite Analysis

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

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

c) Hazard Prevention and Personal Safety

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

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

Developer shall handle Hazardous Materials in compliance with Section 3.14 of the Agreement and the applicable requirements of the Technical Provisions.

d) Training

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

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

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

e) Drug Free Work Zone

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

f) Incident and Emergency management

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

- Maintenance of communication for the exchange of information between Developer, TxDOT, and other involved agencies.
- Coordinated support through interaction with local, State, and federal governmental entities, as well as other entities, for safe and efficient construction.

- Discussion and coordination with Emergency response, traffic control, security, and operational issues affecting construction of the Project, and associated system feeders and exits.
- Procedures to update participating agencies regarding status of construction of the Project, and associated system feeders and exits, to assure safe and timely response to Emergency events. As a minimum, this shall include off-Site and on-Site traffic routing changes, and changes to Site access, fire suppression system modifications and in-service availability of standpipes or fire suppression water supply, if applicable, and changes in the Work that may create a greater likelihood of occurrence of a particular type of Emergency.
- Compliance with the Local Hurricane Evacuation Plan.

2.6 TxDOT-Developer Communications Plan

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

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

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

2.7 Right of Way Acquisition Plan

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

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

2.8 Risk Management Plan

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

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

b) The potential consequences of the identified risks;

c) The probable likelihood of risks;

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

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

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

2.9 Corpus Christi Ship Channel Plan

2.9.1 General Requirements

As part of the PMP, Developer shall submit for Approval to TxDOT and applicable Governmental Entities (including but not limited to the Port of Corpus Christi, the US Army Corps of Engineers and the US Coast Guard) the Corpus Christi Ship Channel Plan (CCSCP), which shall be a comprehensive plan for the monitoring of all Work that may affect the Corpus Christi Ship Channel, the Developer's proposed processes and procedures for notifications to and communications with the applicable Governmental Entities, procedures to ensure that the navigational constraints for the Corpus Christi Ship Channel are not infringed and provisions to ensure Developer has the necessary resources and equipment available to take timely action to mitigate the impact of any unintended obstruction to the Corpus Christi Ship Channel so that any adverse consequences to the Port of Corpus Christi are minimized. The Bridge Demolition Plan as required by Section 13.3.2 shall be consistent with the CCSP.

The CCSP shall be consistent with all Governmental Approvals for which Developer is responsible, for attaining approval from the Port of Corpus Christi and attaining final concurrence of the Section 9 and 10 permits for structures or work in or affecting Navigable Waters as required under Part 33 CFR 322 of the Federal Regulations. The CCSP shall be updated to be consistent with any permit conditions received by Developer.

2.9.2 Requirements for the CCSP

The CCSP shall include the following information at a minimum:

a) How Work shall be performed such that waterway traffic and navigational clearances are not affected and the navigable depths are not impaired.

b) A hazard assessment for all stages of the Work identifying activities where a risk of unintended impact to the Corpus Christi Ship Channel may exist, including falling objects and floating hazards.

c) Equipment and methods proposed to install shielding and protective barriers to prevent debris, construction materials or equipment from falling into the Corpus Christi Ship Channel. The materials to be used as the shielding and protective barrier shall be identified.

d) Procedures for keeping debris records for all components associated with the Construction Work including demolition. A debris report shall be Signed and Sealed by the Engineer of Record. The report shall identify any debris that is known or suspected to have fallen into the Corpus Christi Ship Channel, confirmation that all corrective measures have been taken to remove the debris, and confirmation that all debris identified has been removed.

e) Procedures to control brief delays to waterway traffic where these are allowed by applicable permit. Where such brief closures are approved by the applicable Governmental Entities, procedures for liaison with the applicable Governmental Entities including the provision of notice periods consistent with permit conditions and allowing proper review and approval by TxDOT and the applicable Governmental Entities.

f) Procedures to ensure that floating equipment shall not be located in the channel unless permitted by the applicable Governmental Entity and actively engaged in working on the Project and procedures to ensure that when not working, floating equipment shall be located in approved anchorages or mooring areas outside the navigation channel.

g) Procedures for communications during the operation of any permitted floating equipment including a good quality marine radio present at the jobsite and properly employed to facilitate reliable communication between Developer and approaching waterway traffic.

h) Procedures to identify action if anything is accidentally dropped into the water, including immediate action to remove it and to clear the waterway to the satisfaction of the applicable Governmental Entity.

i) Procedures to prevent the discharge of oil, including oil based paints, into the Corpus Christi Chip Channel as governed by the Federal Water Pollution Control Act and in the event of such discharge procedures by the responsible party to immediately take action to halt the discharge and notify the applicable Governmental Entity.

j) Procedures to ensure that temporary pilings, trestles, falsework outside the navigational channel shall be kept free of accumulations of drift and debris that could affect the channel.

k) Procedures to ensure that whenever components are to be dropped into the Corpus Christi Ship Channel as part of a permitted operation such as demolition a match-marking plan of all components to be dropped into the channel is prepared. The procedure should identify how all components to be dropped shall be indelibly marked to verify complete subsequent removal of the component from the channel according to the match-marked plan.

l) Procedures identifying how Developer intends to deal with unanticipated loss into the channel, during the progress of work, including the recovery and removal of any material, machinery, plant or appliance which may be dangerous or obstructive to navigation.

m) Procedures by which Developer shall give immediate notice with the description and location of such obstruction to the applicable Governmental Entities.

n) Mitigation procedures for dropped components which may include, the marking, by one or more lighted buoys, of obstructions until removed to the satisfaction of the applicable Governmental Entity and the provision by Developer of a towboat (tug) to assist vessels through the bridge on demand.

2.9.3 Sweep and Sounding Surveys

A hydrographic sweep survey of the bottom of the channel shall be performed: (i) prior to the commencement of Construction Work; (ii) whenever debris is known or suspected to have fallen into the channel; and (iii) following completion of the demolition work to ensure that all structures and construction debris/obstructions above the bottom of the channel (and down to the specified channel dredge depths) have been removed.

A Professional Land Surveyor licensed in the State of Texas shall be responsible for all survey work performed. The survey techniques outlined in the USACE publication Engineering and Design - Hydrographic Surveying (EM 1110-2-1003) shall be followed.

The hydrographic survey shall be conducted with a multibeam transducer or equivalent equipment. The minimum vertical accuracy of the underwater depth soundings will be within plus or minus one-half (1/2) foot. The vertical reading will be recorded to the nearest one-tenth (0.1) foot. The minimum horizontal accuracy of the underwater depth soundings will be within two (2) feet of the true position. Point density will be a minimum of 3 points for each 2 foot x 2 foot square area. Further, to assure that the best data is

used, all points collected beyond 30 degrees from center shall not be used and a 50 percent overlap of each subsequent multibeam pass will be required.

At the completion of the initial sweep survey, the survey results will be reviewed. Based on this review, if it is determined that additional material/debris needs to be removed, Developer shall be responsible for removing the material/debris identified. After the additional material/debris has been removed, another hydrographic sweep survey shall be conducted.

Hydrographic sweep surveys and material/debris removal shall be performed until no material/debris is found in the sweep areas. After all identified material/debris has been removed, a final sweep survey will be performed. After the final sweep survey has been performed, soundings will be taken along cross sections at approximately 25 foot intervals

The final sounding information shall be submitted to the applicable Governmental Entities for review and approval. The final survey submission shall be stamped by a Professional Land Surveyor licensed in the State of Texas and shall include electronic files in a format/software approved by the applicable Governmental Entities.

2.10 Sustainability Plan

The Developer shall provide a Sustainability Plan that builds upon its draft Sustainability Plan provided in the Proposal and describes the approach and commitment to sustainable design, construction, operational, and maintenance practices. Utilizing the Federal Highway Administration (FHWA) "Infrastructure Voluntary Evaluation Sustainability Tool" (INVEST) 1.0 program, Developer shall obtain a "Platinum" sustainability rating for the Project Development (PD) Module using the "Urban Extended" Scorecard, and a "Silver" sustainability rating for the Operations and Maintenance (OM) Module. The plan shall, at a minimum, include the following:

a) **Energy and Energy Efficiency.** The Sustainability Plan shall describe Developer's plans for maximizing energy efficiency throughout the Project, including:
   i. Minimizing energy and fuel usage during construction.
   ii. Innovative ideas for incorporation of energy generation and use of renewable energy sources.

b) **Community and Environmental Justice.** The Sustainability Plan shall demonstrate Developer's commitment to environmental quality and enhancement above and beyond the requirements of the EIS, including:
   i. Minimizing air quality degradation during construction.
   ii. Minimizing and mitigating for disproportionately high and adverse human health or environmental effects of construction activities on minority populations and low-income populations.
   iii. Commitment to sustainable storm water management, specifically the incorporation of permanent Best Management Practices for storm water management.
   iv. Commitment to providing durable permanent Best Management Practice features that minimize long term maintenance.
   v. Proposals for quantifying and minimizing the project's carbon footprint.

c) **Green Building.** The Developer shall locate the Project Management Office in existing, currently unused office space. The Developer may propose (or commit to obtaining) a Leadership in Energy and Environmental Design (LEED) Green Building certification for the Project

Management Office. If the Developer makes this commitment, certification will be required per the third party independent certification procedures defined by the U.S. Green Building Council (refer to www.usgbc.org). The Sustainability Plan shall identify energy efficiency improvements to the office space and commitments (if made) for obtaining LEED certification for the office space.

d) **Waste Reduction and Recycling.** The Sustainability Plan shall describe Developer's approach to minimizing the amount of waste generated by the project. The plan shall also describe the Developer's plans for maximizing the re-use of materials, including construction material from structures and facilities demolished as part of this project. The Developer may also include plans to incorporate into the project recycled materials generated off site. Any such plan must be in conformance with Contract Documents.

e) **Green Project Administration.** The Sustainability Plan shall demonstrate the Developer's overall commitment to green project administration, including:

   i. Tracking all environmental commitments and ensuring completion and appropriate documentation of those commitments.
   ii. Providing construction personnel with the opportunity for construction environmental training, including best practices for minimizing impacts to the human and natural environment.

f) **Materials and Resources.** The Sustainability Plan shall describe the Developer's commitment to using materials produced in a manner that minimizes ecosystem degradation and reduces lifecycle impacts from extraction, production, and transport of virgin materials.

g) **Construction Practices.** The Sustainability Plan shall demonstrate the Developer's commitment to using construction practices that minimize impacts to the environment and community surrounding the project.

h) **Education and Demonstration of Energy Efficiency.** The Sustainability Plan shall include the Developer's proposal to develop and implement at least one project feature that publically demonstrates energy efficiency. This feature shall be a visible element of the project that demonstrates the Developer's and owner's commitment to energy efficiency. The feature can also serve to educate the public on other sustainable project elements and practices. Potential features could include, but are not limited to, the following:

   i. Use of solar panels to generate a portion of the energy needs of the project.
   ii. Use of wind turbine(s) to generate a portion of the energy needs of the project.
   iii. Use of light-emitting diode (LED) fixtures for bridge illumination.

i) **Sustainability Level.** The Sustainability Plan shall identify the number of INVEST points that the Project will obtain as would be determined in a joint Developer/TxDOT/FHWA INVEST 1.0 project scoring workshop, utilizing the INVEST 1.0 Project Development (PD) Module with the "Urban Extended" scorecard, and the INVEST 1.0 Operations and Maintenance (OM) Module. The Developer shall indicate the number of points that the Project will score as follows: points that are attributable to previous TxDOT work, points obtained by the Developer designing and executing the constructed Work, and points that will be provided by the actions of the Developer

during the Operations and Maintenance period of the Contract. The Sustainability Plan shall also define the roles and responsibilities of the Lead Quality Manager in ensuring that the proposals outlined in the Sustainability Plan are carried out during construction, including identification of key personnel and their responsibilities.

Personnel and Staffing. Developer Shall assign a Sustainability Manager responsible for leading Developer's efforts in obtaining sustainability certification as set forth in this Section 2.10. The Sustainability Manager must have been directly responsible for obtaining FHWA Invest Program achievement levels, Envision Program awards, LEEDS certification, or similar certification on significant infrastructure projects on at least one significant infrastructure project within the past 5 years. The Sustainability Manager may be employed by a subcontractor.

2.11 TxDOT Offices, Equipment and Vehicles

Except where noted elsewhere, Developer and TxDOT shall co-locate for the period of time commencing upon issuance of NTP1 and continuing thereafter through 180 days after Substantial Completion to facilitate Project coordination and daily communication. The definition of "co-locate" for this Agreement is office space meeting the requirements of this Technical Provision that are near or with each other along or adjacent to the Project and within two (2) miles of the Project ROW. At a minimum, the following Developer's personnel shall be co-located with TxDOT:

- Project Manager, Design Manager, Lead Roadway Design Engineer, Lead Roadway Bridge Design Engineer and Lead New Harbor Bridge Design Engineer during the design phase
- Project Manager, Construction Manager and Construction Quality Control Manager during the construction phase
- ROW Acquisition Manager during the ROW acquisition phase

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

2.11.1 Computers and Equipment

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

- At least one touch-tone telephone for each personal office area, each with a status indicator, access to all outside lines and conference-call capability; and including speakers for the telephones in the enclosed offices.
- At least one touch-tone conference telephone with satellite microphones for each conference room, each with a status indicator, caller ID, access to all outside lines and conference call capability.
- One high-speed laser computer printer capable of handling 11"x17" prints.
- One high-speed color printer capable of handling 11"x17" prints.
- One high-speed color photocopy machine capable of handling 11'x17" prints.
- One facsimile transmission machine.

- One color scanner capable of handling 11”x17” prints.

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

- All office supplies including copier paper, toners, pens, pencils, notepads and other miscellaneous office supplies.
- Complete voice/data communications cabling system, which include but is not limited to the EMT conduit, bridle \rings, pull boxes, category 5e UTP cable, category 5e “RJ-45” UTP receptacles, category 3 “RJ-11” UTP receptacles, receptacle boxes, cover plates, and fiber optic cable. If Developer can establish, to TxDOT’s satisfaction, that alternate hardware and cabling can achieve the same level of service as TxDOT deems necessary to effectively manage this Project, then Developer can submit for TxDOT’s Approval an alternate plan for hardware and cabling. Developer can use fiber optic or copper cable as long as it is sufficient enough to adequately support the Project and field offices. Developer shall route, terminate, label and test all cable and install voice and data circuits shall be installed in conjunction with ISD and TxDOT Department of Information Resources staff.

Developer shall certify and state supplied components as functional before installation and will bear all responsibility for replacement of parts at work commencement.

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

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

Developer shall ensure that each drop shall contain two data ports with RJ45 connectors and two voice ports with RJ11 connectors.

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

2.11.2 Core Office

Developer shall provide all space, facilities, and support elements necessary to design, construct and maintain the TxDOT core office in accordance with the Contract Documents. Developer shall provide office space, of approximately 6,000 square feet, for TxDOT’s design, Project management and ROW acquisition staff including, the general engineering contractor and other contract employees for a maximum of 30 persons. If it is necessary to locate any of these elements of the Work off-site or outside of this office, Developer shall obtain TxDOT’s prior written consent.

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

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

2.11.2.1 TxDOT Facility Area and Items Provided by Developer

Developer shall provide separate office space for the exclusive use of TxDOT’s design and Project management staff in the TxDOT facility area as specified herein and subject to TxDOT’s prior written Approval. This office space shall be located within the same building or complex as Developer’s office

staff. TxDOT will be reasonable regarding re-use of existing space within Developer's current office facility, providing the space is contiguous and workable in TxDOT's sole discretion.

In regard to the TxDOT facility area, Developer shall ensure the following conditions are achieved:

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

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

Office Facilities and Equipment. Developer shall:

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

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

3. Lighting and Electricity. Include with all interior spaces overhead lighting meeting OSHA, building, and electrical and energy code requirements for similar office space (provide nominal 30 foot candles of light at 30 inches above finish floor). Each office space shall have at least four duplex receptacles, with minimum circuit capacity of twenty (20) amperes.

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

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

6. Accessibility and Licensing. Meet all access requirements of the Texas Accessibility Standards, the Americans with Disabilities Act (ADA) Accessibility Guidelines, as amended (42 USC §§12101, et seq.), and the applicable building code. Developer shall submit facility design plans to the Texas Department of Licensing and Regulation (TDLR) for review and Approval as required by Section 16, Chapter 68 of the Texas Administration Code.

7. Restrooms, Break Room, and Entry Space. Provide access to women's and men's restrooms, break room space and building entry space, these spaces may be shared with Developer's office space/staff. These spaces and all TxDOT spaces shall have access 24 hours per day, 7 days per week, 365 days per year (24/7/365). In lieu of access to a common break room, Developer may provide a 200 SF break room/kitchen within the TxDOT space, with refrigerator with freezer compartment, ice machine, sink including waste disposer, microwave, and dishwasher. Break room/kitchen will have storage closet (25

sq. ft.) and cabinets with drawers and counter tops. In the event that access to restrooms cannot be accessed from a common building entry/lobby, Developer may provide separate restrooms for the TxDOT facility area. In the event it is necessary to locate a separate break room and/or restrooms within the TxDOT facility area, the 6,000 SF TxDOT space allocation may be required to be increased to accommodate these spaces.

8. HVAC. Provide electrical, heating, ventilation, and air conditioning (HVAC) systems capable of maintaining temperatures between 65 and 75 degrees Fahrenheit in all spaces, 24 hours per day, 7 days per week, 365 days per year (24/7/365), through the year. Server room shall have dedicated air conditioning/cooling system capable of maintaining temperatures between 65 and 70 degrees Fahrenheit, and 15% relative humidity.

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

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

11. Networking. Provide a secured wireless network with encryption, operating at both 2.4 and 5 GHz with 802.11ac, b, g and n protocols.

12. Internet. Provide the highest speed internet available in the Project area at NTP1.

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

1. Offices. Enclosed offices for TxDOT's management staff (nominal 150 square feet each) 10 total with keyed door hardware (5 of which shall be within the secure space for TxDOT's ROW acquisition staff).

2. Cubicles. Cubicle area spaces for administration staff (nominal 64 square feet each) 20 total (10 of which shall be within the secure space for TxDOT's ROW acquisition staff); (power supply and data and communication lines to cubicles may be provided through power pole drops).

3. Conference Rooms. One conference room at nominal 25'x 30' (750 SF), one conference room at nominal 12'x 25' (300 SF), and one conference room nominal 10'x 25' (250 SF). The 750 SF conference room and the 250 SF conference room shall be within the secure space for TxDOT's ROW acquisition staff. All shall have dimmable lighting; each conference room shall have one chair for every 24 SF of conference room space and a conference table of sufficient size for each chair.

4. Production Rooms. One production room at nominal 10'x 25' (250 SF) within the secure space for TxDOT's ROW acquisition staff.

5. Document Control Rooms. One document control storage room (250 SF).

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

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

8. Server Room. One computer server room (100 SF) that has limited access and is locked via security card access. Server room shall be accessible via hallway entry not sharing any walls with the exterior of the building, and have no windows, a non-static floor covering, and at least three dedicated 20-amp power circuits and one 30-amp circuit. All patch panels (phone and data) shall be located within the designated server room. Temperature shall be maintained with a dedicated air conditioning/cooling system as defined above.

9. Parking Area. Parking area for at least 35 vehicles (30 staff/5 visitors) that is reasonably level (all-weather surface and all-weather access).

10. Exterior Lighting. Sufficient exterior security lighting that is automatically activated at low light levels to maintain two (2) foot-candles of lighting within the building and parking areas of the site.

11. Corridors. Corridors within the TxDOT facility having a nominal width of 54 inches.

Developer shall provide separate secure space for TxDOT's ROW acquisition staff. A summary of the elements of this secure space described in this Section 2.9.2.1 is as follows:

a) Five offices at 150 SF each;

b) Ten cubicles at 100 SF each;

c) One large conference room at 750 SF;

d) One small conference room at 250 SF; and

e) One production room at 250 SF.

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

1. Flooring. Carpeted flooring (non-static in server room).

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

3. Electrical Outlets. Each office and conference room shall have two (2 data, 1 com Cat 5E) outlets per room, and one (2 data, 1 com Cat 5E) outlet per cubicle, as well as outlets at designated printer, fax and copier locations and any and all shared areas (e.g., workroom, storage room). All data/voice outlets shall be installed next to power outlets.

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

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

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

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

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

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

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

11. Emergency Contacts. 24-hour emergency contact to Developer.

12. Furniture. Developer-provided allowance of $30,000 in the Price for furniture, which shall be obtained by Developer at the direction of TxDOT, and billed through Developer. At the end of the Project, Developer shall have ownership of the furniture and shall be entitled to the full salvage value of the furniture, with the right to retain or otherwise dispose of the furniture at its sole discretion, without any further accounting to TxDOT.

2.11.3 Field Offices

During the Construction Period and at TxDOT's sole discretion during the performance of Renewal Work, Developer shall provide field office space for the exclusive use of TxDOT's field construction staff for the Project as specified herein. The field offices can be combined with the core office described in

Section 2.10.2 as long as the combined offices meet the requirements of Sections 2.10.2 and 2.10.3. Refer to Section 19 for the requirements for Developer's Maintenance Facility.

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

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

In regard to field offices for TxDOT field construction staff, Developer shall ensure the following conditions are achieved:

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

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

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

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

2. Access and Security. Provide separate buildings or trailers for TxDOT staff that include at least two entrances/exits, providing an 8' x 10' (minimum) covered area, from each building or trailer. Each entrance/exit shall be secured with a door lock plus a deadbolt lock.

3. Lighting and Electricity. Include with all interior spaces overhead lighting meeting the requirements of the Occupational Safety and Health Administration (OSHA) and of building and electrical codes for office space. Each office space shall have at least two duplex receptacles. The minimum circuit capacity shall be twenty (20) amperes.

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

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

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

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

8. HVAC. Provide heating, ventilation, and air conditioning (HVAC) systems capable of maintaining temperatures between 65 and 70 degrees Fahrenheit in all spaces through the year.

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

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

11. Networking. Provide a secured wireless network with encryption.

12. Internet. Provide the highest speed internet available in the Project area at NTP1.

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

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

2. Offices/Cubicles. Offices or cubicles for up to 10 field engineer/inspection/ administration staff (64 square feet each).

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

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

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

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

7. Site Amenities. A well-graded site for the office with access road, parking area, and security fence with lockable drive-in gates sufficient to enclose the office and parking area.

8. Staff Parking Area. A parking area for at least 15 vehicles that is reasonably level (all-weather surface and all-weather access) within the boundaries of a security fence.

9. Visitor Parking Area. An all-weather level surface outside the security fence to accommodate visitor parking (all-weather surface and all-weather access-minimum of 1,000 square feet).

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

11. Exterior Lighting. Sufficient exterior security lighting that is automatically activated at low light levels to maintain two (2) foot-candles of lighting within the fenced field office site.

12. Window Security. Security bars on all windows.

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

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

15. Restrooms. Two restrooms including toilets and sinks.

16. First Aid Facilities. Emergency first aid facilities.

2.12 3-D Design

2.12.1 General Requirements

The utilization of three dimensional (3-D) Design is an integral part of the performance of the Project prior to and during construction and throughout the Project's service life. Additionally, the

implementation of 3-D Design techniques is intended to improve quality, reduce risk, improve collaboration with Project stakeholders, provide an early focus toward technical review, and increase opportunity for innovation.

2.12.2 Design Requirements

Developer shall utilize 3-D methodologies and techniques to incorporate the Schematic Design into Developer's Project integrated design files utilizing a 3-D design environment.

2.11.2.1 Geometric Design Requirements

Developer shall create an integrated-model of the existing condition utilizing 3-D methodologies and techniques. The existing condition model shall include existing ground surface and certain subsurface elements (including, at a minimum: drainage structures, Utilities, bridge and wall foundations), features utilizing data from light detection and ranging (LiDAR), sub-surface Utility evaluation (SUE), field surveys, and existing plans data collection including currently available LiDAR or other existing ground surface data (DTM or TIN format) provided by TxDOT.

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

a) Integrated design model deliverables shall consist of 3-D MicroStation file(s) containing 3-D graphical elements (components, contours, superelevation transitions limits, existing and proposed finish grade triangles) representative of the design model, and DTM or TIN surface files.

Developer shall generate all geometric design and 3-D design models of all roadways based upon the approved design criteria and the schematic design. All geometric design shall be in conformance with the State's current design guides and applicable manuals.

Developer shall create preliminary existing and proposed cross sections at a scale of 1" = 20' horizontal and 1" = 20' vertical on 100-foot increments. The design cross sections will be developed from the 3-D model. Developer shall prepare cross sections for I-37, SH 286, US 181, all cross streets and all associated ramps and direct connects within the limits of the project.

Developer shall create horizontal and vertical alignments for all main lanes, frontage roads, ramps, cross roads, pavement transitions and tie-ins to existing lanes, and direct connectors. Developer shall determine vertical clearances at grade separations, underpasses, and overpasses. Developer shall create superelevation and superelevation transition designs for each roadway and verify rollover constraints are adequately addressed in gore locations.

Developer shall include key existing and proposed 3-D Design features for the following Elements of the Work:

a) Roadway

b) Drainage

c) Structures (including, at a minimum, sufficient detail to show top of deck surface, structure type, bottom of beam surface, and pier, abutment and retaining wall locations)

d) Utilities

e) Signing (including, at a minimum, overhead span or cantilever sign structure locations and structure type)

f) Lighting (including, at a minimum, pole and foundation locations)

g) Signals (including, at a minimum, controller, pole and foundation locations)

h) Existing and proposed railroad Elements

i) Foundations, including drilled shafts, of columns, abutments, retaining walls, high mast lighting, gantries, and any other ground penetration to be shown to scale of width and depth

j) Existing structures to remain within 25 feet of the Project ROW

2.11.2.2 Immersive 3-D Over the Shoulder Milestone Review Meetings

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

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

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

  a) Roadway

  b) Drainage

  c) Structures (sufficient detail to show top of deck surface, structure type, bottom of beam surface, and pier, abutment and retaining wall locations)

  d) Utilities

  e) Signing (overhead span or cantilever sign structure locations and structure type)

  f) Lighting (pole and foundation locations)

  g) Signals (controller, pole and foundation locations)

  h) Existing and proposed railroad Elements

  i) Foundations, including drilled shafts, of columns, abutments, retaining walls, high mast lighting, gantries, and any other ground penetration to be shown to scale of width and depth

  j) Existing structures to remain within 25 feet of the Project ROW

3 PUBLIC INFORMATION AND COMMUNICATIONS

3.1 General Requirements

Developer shall take primary responsibility for all public involvement activities and shall coordinate all public information communications with ongoing TxDOT public information activities to ensure that a consistent message is being distributed to the Customer Groups. Developer shall provide, for review and Approval, copies of all materials to be presented to the public or the media, to TxDOT prior to dissemination per agreed upon timelines.

3.2 Administrative Requirements

3.2.1 Public Information and Communications Plan

At least60 days prior to NTP2, Developer shall submit to TxDOT for Approval a comprehensive Public Information and Communications Plan (PICP), based upon the public information and communications plan submitted with Developer's Proposal, which informs, educates, and engages the Customer Groups throughout every stage of the Project. Submittal shall be in both hardcopy form and electronic format compatible with TxDOT software. TxDOT Approval of the PICP shall be a condition of issuing NTP2.

The PICP will include strategies and tactics, specific timelines, and deliverables. The PICP shall include, but not be limited to:

a) A detailed work plan;

b) Key issues anticipated to be addressed through the life of the Project;

c) Identified Customer Groups and specific plans to respond to their concerns and needs in all respects to the Project;

d) How the public will be notified of construction, traffic detours, and potential impacts;

e) Specific outreach and engagement activities and the frequency of those activities;

f) Communication tools and modes;

g) Protocols and points of contact for traffic advisories, emergency events, open records requests, environmental-related communications and communications with elected officials and the media;

h) Developer's process for measuring the effectiveness of the PICP, and for revising the PICP as necessary to address new communications issues as they arise; and

i) Developer's process for documenting all communications.

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

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

Developer shall maintain and routinely update the plan to ensure delivery of high-quality, well-executed communications throughout the Term of the Agreement.

Together with TxDOT's designated TxDOT Corpus Christi District Public Information Officer (PIO), Developer shall review and update the PICP no less than annually. TxDOT may audit Developer's performance of the activities set forth in the PICP. Developer shall make appropriate changes to the PICP to meet the findings of any audit or review and to suit the changing goals and needs of the Project. Developer shall cooperate with TxDOT to amend the PICP as required to suit circumstances as yet

unknown, including public reaction to the impacts, real or perceived, from the Work and the depth, breadth and frequency of information necessitated by Customer Groups.

Developer shall document the efforts and results of the PICP in measurable terms to clearly indicate compliance.

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

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

b) Offer Customer Groups sufficient opportunities and methods for providing input.

c) Provide information and respond to public questions and comments in a timely, accurate and consistent manner.

d) Demonstrate to Customer Groups that the Project will be developed pursuant to a well-planned program.

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

f) Provide public information that facilitates alternative trip planning during construction.

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

h) Build upon TxDOT's positive reputation as a good partner to the community.

i) Build upon the efforts of the successful communications program carried out during the environmental process and reinforce relationships with key stakeholders.

j) Implement a fully bilingual program.

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

Public Information and Communications Strategies

a) Develop a committee to coordinate ongoing dialogue among Customer Groups, TxDOT, and Developer.

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

c) Following Approval from the PIO, Developer shall organize and manage meetings and communications with key elected officials, the general public, representatives of civic organizations, businesses, and special interest groups along the Project corridor (individually or in groups) for the purpose of responding to questions and concerns and building rapport with Customer Groups, as well as establishing ongoing two-way communications.

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

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

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

g) Develop specific communications strategies for the Hillcrest, Washington Coles, and North Beach neighborhoods.

h) Coordinate tours of the Project at appropriate times and stages and as requested by TxDOT.

Media

With TxDOT prior Approval and in keeping with the *Associated Press Stylebook*:

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

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

c) Place Project-related messages in the appropriate media.

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

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

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

Environmental

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

Developer shall assign audit and quality assurance responsibilities to a member of its quality assurance team. The Public Information Coordinator shall not perform external audit and quality assurance responsibilities because of the potential conflict of interest.

3.2.2 Project Status Reports

Developer shall report on the status of PICP tasks and deliverables on a regular basis, as follows:

- **Weekly**: Developer shall send TxDOT a high-level weekly status report of public information and communications activities electronically. The report will feature metrics such as how many stakeholder meetings were held, how many phone calls were received on the hotline, and other pertinent data. The document will be tailored as an internal document to track progress.
- **Monthly**: Developer shall create monthly a full color Project status report that provides essential information about the Project, including a listing of upcoming Project-related activities and events. This document will be tailored as a public document to be distributed to Customer Groups, Elected Officials, and other stakeholders. Developer shall provide an electronic copy of the monthly Project status report to TxDOT.

3.2.3 Public Information Coordinator

Developer shall provide a Public Information Coordinator to lead Developer's public involvement activities on a day-to-day basis throughout the Term of the Agreement. The Public Information Coordinator shall have a minimum of five (5) years of relevant experience on projects of similar type and scope, and the ability to competently perform the following:

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

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

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

d) Facilitate communication among Developer, TxDOT personnel (including TxDOT's PIOs), Customer Groups and Governmental Entities.

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

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

g) Prepare public exhibits, audiovisual presentations, and regular updated materials (e.g., fact sheets, maps, and collateral material).

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

i) Coordinate with the TxDOT Corpus Christi District PIO regarding all media inquiries, outreach, and elected official contact.

j) Speak fluent Spanish or have Spanish translator available at all times.

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

3.2.4 Public Information Office and Hotline

Developer shall maintain a Public Information Office for the Term of the Agreement. The hours of operation for this office shall be as indicated below.

During NTP2 and NTP3, the minimum hours of operation of the public information office shall be as follows.

Monday-Friday	8:00 a.m. – 6:00 p.m.
Saturday	9:00 a.m. – Noon
Sunday	Closed

Developer shall extend hours of operation to appropriately service Customer Groups.

This office shall serve as the primary business location for the Public Information Coordinator and shall be conveniently located to the Site. The public information office shall facilitate the exchange of information between Developer and the public and provide a centralized location for residents and other Customer Groups to obtain information on the Project, including Project maps and Plans, alternative

routes, lane closures, construction updates, community impacts, and commute options. Developer shall make every effort to ensure that signage and materials at the public information office are bilingual.

The public information office shall have readily available two conference rooms capable of hosting Customer Group meetings. The rooms shall be ADA-compliant, convenient to and accessible by Customer Groups and appropriately supplied with electrical outlets, tables, chairs, and other basic equipment to meet meeting requirements. These conference rooms shall be at a convenient and accessible location that facilitates attendance by Customer Groups. These rooms shall accommodate at least 10 persons. If Customer Group meetings require greater accommodations, Developer shall be responsible for finding suitable venues, which shall meet all requirements set forth above for conference rooms.

In addition to the services listed above, Developer shall provide a 24-hour telephone hotline, staffed locally during normal business hours of the public information office, with a recorded bilingual message describing Emergency procedures after hours. Persons staffing the hotline shall be bilingual. Developer shall respond to voicemail messages left after hours within 24 hours of receiving the message. Hotline shall be fully functional and staffed in advance of the start of any field investigation work near homes and all construction activity.

3.2.5 Customer Groups

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

a) Media

b) Governmental Entities, including regulatory and law enforcement agencies

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

d) Business owners within or adjacent to the Project corridor

e) Port of Corpus Christi, Port Industries, Utilities, railroads, and transportation authorities and providers (such as local airports or transit operators) affected by the project

f) Neighborhood associations or groups, in particular, Hillcrest, Washington Coles, and North Beach neighborhoods, community groups, and other organizations with special interest in the Project

3.2.6 Events

Multiple opportunities will be provided for the public to be engaged in the Project in fun and informative settings including but not limited to:

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

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

Developer's PICP shall address the frequency of public meetings and allow such frequency to increase or decrease as needs arise to better inform and engage Customer Groups. Developer shall propose a schedule

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

To maximize public participation, Developer shall advertise public meetings at a minimum of ten (10) to fourteen (14) days advance notice in the appropriate media outlets, such as local newspapers, and television and radio stations. Developer shall be solely responsible for meeting advertisement and related costs.

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

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

b) Street and roadway detour design and implementation

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

d) Haul routes

e) Methods to minimize noise and dust

f) Environmental mitigation measures

Developer shall notify TxDOT a minimum of two (2) weeks in advance of any meeting forums with the public, and 48 hours in advance of any informal meetings individuals or other informal meetings. TxDOT reserves the right to attend any such meetings. When requested by TxDOT, Developer shall participate in and provide support for any meetings with the Customer Groups called and conducted by TxDOT. When TxDOT decides to conduct such meetings, Developer shall share, in a readily manipulable form, all necessary information regarding potential Customer Groups at TxDOT's request. Developer shall bear all costs associated with the meetings organized and managed by Developer, including meeting documentation and submittal to TxDOT for review.

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

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

Significant Local Events: Developer shall coordinate with the TxDOT Corpus Christi District PIO and local stakeholders including but not limited to: City of Corpus Christi, San Patricio and Nueces Counties, Port of Corpus Christi, neighborhood associations, American Bank Center, Texas State Aquarium, and

schools to develop a list of local events that could be impacted by construction activities. These events and holidays associated with large traffic requirements must be accommodated to the extent possible.

3.2.7 Meeting Summaries

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

a) A complete list of attendees (including their affiliations and telephone numbers, if provided)

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

c) Documentation of the issues discussed and any associated solutions

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

For any formal public meetings or open houses at which a court reporter is required, Developer shall also include detailed verbal transcripts in the summary within two (2) weeks. Developer shall submit draft versions of all meeting summaries to TxDOT for review before distributing final versions to the meeting attendees and appropriate Customer Groups.

3.2.8 Communication Tools

Developer shall prepare and distribute materials regarding Project-related subjects, using all appropriate methods, including but not limited to: Project website, meetings, news releases, telephone correspondence, newsletters, email, hotlines, Highway Conditions Reports, dynamic message signs, Web alerts, social media, maps, displays, renderings, presentations, brochures, pamphlets, highway advisory radio and video news releases.

Project Website: Developer shall develop, maintain, and update the public Project website to convey Project-related information, including, but not limited to:

a) Utilize current Project information and current website URL

b) Developer contact information

c) Project maps

d) Frequently asked questions (FAQs)

e) Current Project activities addressing design, construction, and maintenance

f) Timing of street and ramp closures and openings

g) Recommended route alternatives during closures

h) Newsletters

i) Project status reports

j) Event calendar

k) Materials presented at events

l) Meeting summaries

m) Links to other related sites as deemed appropriate by TxDOT

n) Comment form

o) Mailing list request form

The website shall also contain other general Project-related information that enhances the engagement or education of the general public. The website shall also provide for question and feedback opportunities for public communication. Developer shall regularly review information on this public website and update monthly throughout the Term of the Agreement to provide current and appropriate information and Developer shall develop and implement a plan to make the Customer Groups aware of the Project website. The Project website shall contain contact information for emergency situations such as links to the local police, fire, EMS, and hazardous materials response units. Developer shall make all materials to be posted to the Project website available to TxDOT for review and Approval prior to posting.

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

Developer, working collaboratively with TxDOT, shall assess the need for multi-lingual communications online.

3.2.9 Lane Closure Notification

Subject to the Lane Closure restrictions set forth in Section 18 (Traffic Control), Developer shall provide TxDOT and appropriate Customer Groups a minimum of two weeks advance notice for planned Lane Closures and/or traffic switches planned to be in effect longer than 24 hours, and a minimum of 48 hours advance notice for Lane Closures that are planned to be in effect less than 24 hours, using all appropriate tools as needed. Tools should include website updates, social media, and media outreach. In addition, Developer shall be responsible for the rental and placement of portable messaging signs (dynamic and static) as required by the approved traffic control plan to alert the public to traffic impacts/road closures. Messaging on the signs will be current and accurate at all times. The Public Information Coordinator shall input all Lane Closures (or an event that results in Lane Closures) into the TxDOT Highway Conditions Report.

Developer shall coordinate planned Lane Closures and Emergency event Lane Closures that may affect crossing TxDOT facilities, as set forth in Section 18.3.1.3.

3.2.10 Emergency Event Communications

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

In the event of an unforeseen Emergency, timely notification shall mean as soon as practicable, but in no event longer than within one hour of the occurrence. If advanced warning is available for an Emergency event such as ice/snow, timely notification shall mean as soon as practicable, but in no event longer than within one hour of the time the information is available. In both situations, the Public Information Coordinator shall continue to provide updated information, as available and on a timely basis, until the Emergency no longer exists.

3.2.11 Third Party Claims

3.2.11.1 Claims against third parties by Developer

As part of the PICP Developer shall prepare policies related to the pursuit of claims against third parties for damage caused to the Project, including procedures for sensitive handling of claims in which there is death or injury, and processes to keep TxDOT informed of the status of claims against third parties.

3.2.11.2 Third Party Claims against Developer

Other than the case of a third party claim that Developer has notified and TxDOT has accepted as a shared liability in accordance with Section 18.2.8 of the CDA, in no case will TxDOT accept any liability for claims from a third party in connection with damage to persons or property within the O&M Limits.

In accordance with Section 18.2.1 of the CDA, TxDOT will forward to Developer any claims or complaints it receives from the public in connection with the Project. Developer shall be responsible for resolving all claims complaints whether received directly or forwarded by TxDOT appropriately and in a timely manner and shall retain a record of the actions it has taken with respect to each such claim or complaint.

If Developer determines that neither Developer nor any Developer-Related Entity is responsible for the damage, Developer shall notify the complainant of this position promptly, by certified mail and shall maintain a copy of all correspondence. All documentation including a copy of logs and claims shall be available for inspection by TxDOT on request.

Developer shall include the following within the PICP related to third party claims:

a) Procedures to respond immediately to public complaints related to damages and to act promptly to resolve claims for damage to vehicles, persons and property caused by the Work (e.g. construction activities) or as a result of the condition of the Project (e.g., broken windshields, damaged tires or damaged vehicle paint).

b) Procedures for prompt response to complaints from the public related to dust, noise and other nuisance caused by the Work and policies and procedures to mitigate public complaints, including carwash service vouchers, air filters etc.

c) Procedures to log all complaints, dates and times of claims and incidents, contact information (including the name, address, telephone number, and e-mail address of complainant), name of the respondent, any requirements from the complainant, whether the complaint is satisfied, and whether the claim has been or will be forwarded to Developer's insurance carrier.

4 ENVIRONMENTAL

4.1 General Requirements

Developer shall deliver the Environmental Commitments required by the RFP, Contract Documents, Environmental Laws, Governmental Entities, Governmental Approvals, Permits, Final Environmental Impact Statement (FEIS)/Record of Decision (ROD), Environmental Permits, Issues, and Commitment (EPIC) Sheets, and all applicable federal and state Laws and regulations. To that end, Developer shall develop, operate, and maintain a Comprehensive Environmental Protection Program (CEPP) for the Work to ensure environmental compliance with all applicable Environmental Laws and Commitments. The CEPP shall obligate Developer to implement the measures taken during the performance of the Work to avoid and minimize impacts on the environment from the design, construction, maintenance, operation, and rehabilitation activities of the Project and to meet all environmental commitments.

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

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

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

4.2 Environmental Approvals

4.2.1 New Environmental Approvals and Amended TxDOT-Provided Approvals

TxDOT-Provided Approvals are based on the Schematic Design as presented in the Environmental Approvals. Such Approvals may require re-evaluation, amendment, or supplement as the Work progresses or in order to accommodate actions not identified in the Environmental Approvals or covered specifically by existing resource agency coordination. Changes to the Schematic Design or incorporation of Additional Properties into the Project shall require the validity of existing Environmental Approvals to be reassessed and may require new Environmental Approvals. Any further environmental documentation shall be done in accordance with the TxDOT Environmental Manual.

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

Developer shall be responsible for ensuring compliance with the conditions and schedules set forth in amendments to any TxDOT-Provided Approvals or new Environmental Approvals. TxDOT may, in its

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

4.2.2 Responsibilities Regarding Environmental Studies

Developer shall be responsible for conducting continuing environmental studies based on the Environmental Approvals and Schematic Design.

Developer shall be responsible for conducting environmental studies and re-evaluations caused by actions not identified in the Environmental Approvals, actions not covered specifically by existing resource agency coordination, or incorporation of Additional Properties into the Project. Developer shall be responsible for all coordination of environmental studies with appropriate Governmental Entities, except where TxDOT has agreements with Governmental Entities to perform such coordination.

Currently, TxDOT is coordinating permits with the U.S. Army Corps of Engineers (Section 10 and Section 404 of the Clean Water Act) with Section 401 Water Quality Certification from the Texas Commission on Environmental Quality (TCEQ), and the U.S. Coast Guard (Section 9 of the Rivers and Harbors Act). TxDOT anticipates that preliminary Approvals of these permits will be in place at the time of the issuance of the EIS ROD. The Developer shall be responsible for submittal of the final design and any design modifications or change in permit conditions to each of the regulatory agencies for Approval. Developer shall be responsible for any and all mitigation requirements and commitments as defined in the EIS ROD, Permits, and Agreements.

4.2.3 TxDOT Review and Approval of Developer Submissions

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

4.2.4 TxDOT-Provided Approvals

The TxDOT-Provided Approvals are:

a) The Draft Environmental Impact Statement (DEIS), approved November 2013;

b) The Final Environmental Impact Statement (FEIS), anticipated to be accepted and released for review and comment in November 2014; and

c) The Record of Decision (ROD), anticipated to be issued by the Federal Highway Administration (FHWA) in December, 2014 following the review and comment period.

4.3 Comprehensive Environmental Protection Program

As part of the PMP, Developer shall develop and implement a Comprehensive Environmental Protection Program (CEPP), applicable throughout the Term of the Agreement to establish the approach, requirements and procedures to be employed to protect the environment. The CEPP shall be developed in the form of a comprehensive environmental management system incorporating all features and guidelines outlined in ISO 14001. All component parts shall reflect in order of priority: impact avoidance, minimization and, mitigation. The CEPP shall satisfy applicable TxDOT and resource agency requirements, including those detailed as commitments in any Environmental Approvals.

The CEPP shall be the overarching program by which Developer shall cause Environmental Commitments made during the Environmental Approval and permitting processes, and other environmental requirements to be carried forward and reflected, as appropriate, in the design and implemented throughout the Work.

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

a) Environmental Management System (EMS)

b) Environmental Compliance and Mitigation Plan (ECMP)

c) Environmental Protection Training Plan (EPTP)

d) Hazardous Materials Management Plan (HMMP)

e) Communication Plan (CP)

f) Construction Monitoring Plan (CMP)

g) Recycling Plan (RP)

h) Environmental team resumes, updated as applicable

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

4.3.1 Environmental Management System

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

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

a) CEPP component parts

b) Weekly Environmental Monitoring Reports

c) Investigative Work Plans, Site Investigation Reports, and remedial action plans as necessary for hazardous material discovery/remediation

d) Wetlands delineations and appropriate Section 404 Permit Application if changes to the design or temporary construction impacts are necessary

e) Port Permit

f) US Coast Guard Permit

g) USACE Permit(s)

h) Mitigation or resource monitoring reports, as required by resource-specific mitigation plans

i) Designs and coordination for wetland and floodplain mitigation where required

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

k) TPDES Construction General Permit (TXR150000), Notice of Termination for Work completed

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

m) Completed Permit applications and permits as issued

n) Pre-Construction Inspection Report

o) Training documentation

p) Developer's final noise monitoring results, if different than that included in the TxDOT-Provided Approvals

q) EPIC Sheets

4.3.2 Environmental Compliance and Mitigation Plan

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

The ECMP shall include the following components:

- **Environmental Permits, Issues, and Commitments (EPIC) Sheets**

Developer shall develop and maintain EPIC construction plan sheets. Such EPIC sheets shall identify applicable permits and Environmental Commitments and shall be updated throughout the construction period to represent on-Site conditions.

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

Developer shall keep construction noise to a minimum near residential areas including Hillcrest, Washington Coles, and North Beach neighborhoods in particular, and all other sensitive areas during Night-time Hours. Such requirements shall be reflected in the EPIC sheets. Developer shall obtain prior TxDOT Approval to vary from these hours.

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

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

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

b) Procedures for incorporating additional properties outside the original National Environmental Policy Act (NEPA) approved schematic and any off- right-of-way within one linear mile of the Project limits to comply with the CGP and the Project's SW3P;

c) Procedures for handling non-compliance issues;

d) Escalation procedures for SW3P items; and

e) Procedures for implementing detention Best Management Practices (BMP).

Developer shall reference the *TxDOT Corpus Christi District Storm Water Management Program*, available in the Reference Information Documents (RID), in its development of the SW3P.

- **State Listed Species and Unregulated Habitat**

Developer shall document how it will address state listed species and unregulated habitat. The documentation shall comply with all Memorandums of Understanding (MOUs) and Memorandums of Agreement (MOAs) TxDOT has with the Texas Parks and Wildlife Department (TPWD) including the requirement for coordination with TPWD to be conducted by TxDOT. The documentation at a minimum shall include:

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

b) Procedures for complying with any commitments regarding state listed species and unregulated habitat.

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

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

a) Processes for training personnel on the requirements of the ESA and FWCA;

b) Processes for communicating any commitments regarding ESA and FWCA; and

c) Procedures for complying with any commitments, including mitigation, regarding ESA and FWCA.

- **Marine Mammal Protection Act**

a) Process for communicating any commitments regarding observations and protections for Marine Mammals.

- **Coastal Management Program**

a) Process for coordination and communication with the Texas General Land Office regarding the Coastal Management Program.

- **Traffic Noise**

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

a) Processes for carrying out noise mitigation measures as identified and discussed in the Schematic Design and any supplemental noise studies completed by Developer;

b) The Developer shall construct the noise walls in the early construction phases of the Project to help minimize construction noise. Prior to initiating Construction Work on any portion of Frontage Roads, or main lanes located in the vicinity of a portion of a required noise wall, the Developer shall construct the said portion of required noise wall;

c) Processes for carrying out noise mitigation measures determined throughout the Term

To fulfill the commitments of the previously mentioned TxDOT-Provided Approvals, Developer shall be responsible for implementing all noise mitigation measures to minimize construction and long-term impacts of the Work as prescribed in TxDOT-Provided Approvals and subsequent TxDOT-Provided Approvals secured by Developer. Developer acknowledges that TxDOT-Provided Approvals and proposed permanent noise mitigation are based on the Schematic Design and Schematic Right-of-Way (ROW). Any revisions to the previously committed permanent noise mitigation based on an unavoidable required design change must be submitted to TxDOT for review and Approval.

Developer shall be responsible for public notification and involvement per *TxDOT Guidelines for Analysis and Abatement of Highway Traffic Noise* and in accordance with Section 3. TxDOT shall be allowed time for review, comment, and Approval of all public notices, correspondence, invitations, and presentation materials in prior to delivery and presentations to the public. Developer shall allow fifteen (15) Days for adjacent affected property owner comments after each noise workshop.

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

- **Well Impacts and Requirements**

Developer shall document how it will address wells (such as municipal, domestic, irrigation, oil and gas, or monitoring and observations wells) encountered during the Term. The documentation shall include that Developer is responsible for plugging and abandoning all wells in accordance with Item 103, Disposal of Wells of TxDOT's *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (2004)*, as well as Developer is responsible for any required remediation efforts. The documentation at a minimum shall include:

a) Process for training personnel on recognition of wells;

b) Procedures for handling wells; and

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

- **Cultural Resource Studies**

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

Subsequent to issuance of Notice to Proceed 1(NTP1), the Developer shall be responsible for performing any necessary cultural resource surveys, evaluations, testing, and mitigation in those areas outside the footprint of the Project ROW shown on the Schematic Design and within the area of potential effects. Developer shall coordinate all necessary Antiquities Permits through TxDOT. Developer shall obtain Antiquities Permits from the Texas Historical Commission (THC) for archeological surveys, testing, monitoring, and data recovery.

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

If evidence of possible archeological materials and/or historic property not previously identified in the environmental document are encountered during the course of the Work, Developer shall immediately cease Work in the immediate area and contact TxDOT to initiate post-review discovery procedures under the provisions of the Programmatic Agreement (PA) among TxDOT, State Historic Preservation Office (SHPO), FHWA, and Advisory Council on Historic Preservation (ACHP) as well as the MOU between TxDOT and the THC. Developer shall undertake appropriate measures to protect the site from further intrusion to the extent feasible until an appropriate evaluation of the site can be made by a qualified representative. Work shall not be resumed in the area until Developer receives notification and Approval from TxDOT.

- **Public Involvement**

Developer shall be responsible for implementing and documenting a public involvement program that complies with all federal and state public involvement requirements, including those specifically related to cultural resources. Applicable requirements include, but are not limited to, 23 CFR Part 771, 40 CFR Part 1500, 43 TAC §2.84 and §2.101—§2.110, Section 106 of the National Historic Preservation Act (36 CFR 800), Chapter 26 of the Texas Parks and Wildlife Code, the Civil Rights Act of 1964, and the Civil Rights Restoration Act of 1987. Developer shall be responsible for conducting all public involvement requirements for the Term except where TxDOT has agreements with Governmental Entities to perform public involvement requirements. The public involvement requirements shall be outlined in a comprehensive Public Information and Communications Plan, discussed in Section 3.

- **Standard Operating Procedures**

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

a) Controlling dust during construction;

b) Mitigating noise and vibration during construction;

c) Mitigating light intrusion on adjacent properties;

d) Managing contaminated soil and groundwater, especially during excavation, treatment, storage, transportation, and disposal;

e) Preventing, controlling, and mitigating fugitive noxious or toxic vapors or particulate matter (dust), contaminated soil, and contaminated groundwater during disturbance of noxious or hazardous materials and media;

f) Coordinating and communicating with potentially affected public prior to initiating work that may generate emissions or discharges that could cause public concern;

g) Managing material coated with lead based paint during demolition, storage, transport, and disposal;

h) Managing asbestos containing material during testing, treatment, storage, and removal;

i) Managing all other hazardous materials that may be encountered; and

j) Complying with jurisdictional waters and wetlands permits.

4.3.3 Environmental Protection Training Plan

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

a) Educate every worker to:

- Recognize the overall importance of environmental issues to constructing, operating and maintaining a successful Project.
- Know the limits of regulated jurisdictional areas within and adjacent to construction areas.
- Understand and acknowledge the various environmental sensitivities of the Project.

b) Train every worker to:

- Recognize environmentally sensitive resources that may be encountered during the Work.
- Avoid or take appropriate action to minimize environmental impacts from the Work.
- Know the required actions, practices, and procedures regarding regulated resources.
- Understand protocols for meeting Environmental Commitments for post-review discoveries.

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

d) Convey to all workers, Developer's management commitment to the Project's environmental quality.

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

4.3.3.1 EPTP Scope and Content

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

a) Overall importance of environmental protection to the Project

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

c) Overview of Developer’s Environmental Commitments and responsibilities at the Project level.

d) Worker responsibilities.

e) Wetlands and Waters of the United States identification.

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

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

h) Required mitigation measures.

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

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

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

l) Groundwater protection requirements.

m) CWA regulations and surface water protection requirements.

n) Overview of noise and residential impact reduction procedures.

o) Air quality requirements.

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

Developer shall submit to TxDOT for review and Approval course outlines containing learning objectives designed to achieve stated goals and suggested staff attendance for all anticipated training requirements through the Term of the Agreement. Developer shall submit course outlines within ninety (90) Days after NTP1.

4.3.4 EPTP Participation

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

4.3.4.1 EPTP Schedule

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

4.3.5 Hazardous Materials Management Plan

Developer shall prepare a Hazardous Materials Management Plan (HMMP) for the safe handling, storage, treatment and/or disposal of Hazardous Materials, whether encountered at or brought onto the Site by Developer, encountered or brought onto the Site by a third party, or otherwise, during the Term of the Agreement. The HMMP shall address the prevention, control, and mitigation of fugitive noxious or toxic vapors or particulate matter (dust), contaminated soil, and contaminated groundwater during disturbance of noxious or hazardous materials and media. Developer shall submit the final HMMP to TxDOT for review and Approval in its good faith discretion within sixty (60) Days of NTP1; Approval of the Plan by TxDOT shall be a condition of commencement of Construction Work.

The HMMP shall provide the identification and contact information for designated responsible individuals in the management of Hazardous Materials, include procedures compliant with all applicable Environmental Laws and include, at a minimum:

a) Procedures for updating Material Safety Data Sheets (MSDS), per Occupational Safety and Health Administration (OSHA) requirements, for all chemicals used on the Project for the Term of the Agreement;

b) Designated individuals responsible for implementation of the plan;

c) Procedures for identifying and documenting potentially contaminated sites which might impact Project development;

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

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

f) Procedures for developing a detailed Spill Response Plan for the Term of the Project, including the prevention, control, and mitigation of fugitive noxious or toxic vapors or particulate matter (dust), contaminated soil, and contaminated groundwater during disturbance of noxious or hazardous materials and media;

g) Processes for training personnel for responding to and mitigating Incidents involving contamination, non-hazardous waste, and hazardous materials;

h) Procedures for maintaining appropriate communication with the public regarding the planned handling and unplanned incidents involving contamination or hazardous material;

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

j) Provisions for a Hazardous Materials training module as an element of the EPTP component of the CEPP; and

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

The HMMP shall include provisions for making all on-Site workers aware of and able to recognize the potential Hazardous Materials to which they may be exposed, limiting Subcontractors and other Site workers' exposure to Hazardous Materials and providing all necessary personal protection equipment to protect workers from exposure. The HMMP shall require Developer to provide any non-Developer personnel who visit the Project with the appropriate personal protection equipment.

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

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

4.3.5.1 Investigative Work Plans and Site Investigative Reports

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

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

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

The Site Investigative Report shall address the following:

a) the characterization of the impacted area;

b) sampling efforts and findings;

c) opportunities to avoid the contamination by adjusting the design;

d) level of response action warranted if the contamination cannot be avoided;

e) an estimate of the volume of contaminated media requiring excavation, treatment, storage, transportation, and/or disposal;

f) feasibility of initiating response actions prior to construction;

g) pursuit of cost-reimbursement from responsible parties;

h) the need for completing response actions concurrent with construction; and

i) the nature of any special specifications and provisions necessary for incorporation into the Project.

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

4.3.6 Communication Plan

Developer shall develop an Emergency Communication Plan (ECP) which describes in detail the protocols and communication hierarchy for information distribution related to the compliance with the CEPP. The CP will include names and contact information, including Emergency contact information, and the preferred methods of routine, and Emergency communication distribution.

4.3.7 Construction Monitoring Plan

The Construction Monitoring Plan (CMP) shall identify times, locations, and other conditions where monitoring of construction activities are to be performed to maintain and cause compliance with Environmental Laws, Environmental Approvals, and the Contract Documents. The CMP shall establish and/or document schedules, protocols and methodologies to be used for monitoring Work with an emphasis on timely reporting, corrective actions and adaptive management. The CMP shall establish reporting procedures, identify reporting requirements and establish controls for report distribution and records retention. Developer shall make all Environmental Monitoring Reports available for review by TxDOT at TxDOT's request. Should any non-compliance or violation be observed that represents an imminent danger to human health or the environment, the CMP shall include procedures to cause immediate notification of TxDOT.

Prior to NTP2, Developer and TxDOT shall jointly inspect existing facilities, structures, and environmentally sensitive areas in the vicinity of the Site but not included as part of the Work. Developer shall provide a minimum of 10 Business Days advance notice to TxDOT of this joint inspection. The inspection shall document the pre-construction condition of vegetation, streets, sidewalks, landscaping, residential and commercial property, creeks, storm drainage and infrastructure. The purpose of the inspection is to provide a point of reference from which TxDOT can determine if any facility, structure and environmentally sensitive area damaged during the Work is restored to its pre-construction condition. Developer shall document the inspection with a report that shall include photographs, sketches, maps, and narratives clearly depicting the pre-construction Site condition.

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

The post award inspection shall inspect the Municipal Separate Storm Sewer System (MS4) located within and adjacent to the Site. During the inspection, Developer shall note the following:

a) Storm drains, culverts, swales, and other components of the MS4 that Developer verified as free of floatable trash, silt, debris, and functioning as originally intended.

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

c) Siltation of culverts, concrete swales, and other components of the MS4.

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

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

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

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

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

4.3.8 Recycling Plan

The recycling plan shall document and fully detail Developer's commitment to recycling, waste minimization and use of "green products" during all aspects of Work. The recycling plan shall document Developer's recycling initiatives as well as methods and procedures for maximizing the use of recycled materials in all aspects of the Work. The recycling plan shall be reviewed and approved by TxDOT, prior to NTP2. The recycling plan for the demolition and removal of the existing bridge structure must be reviewed and approved by TxDOT prior to demolition activities. Hazardous Waste, as defined by 40 CFR Part 261, shall not be recycled. If nonhazardous recyclable materials are used in lieu of TxDOT approved construction and maintenance materials, Developer shall follow the TxDOT Material Specification DMS 11000.

4.4 Environmental Personnel

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

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

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

b) ET staff response times during the Work.

4.4.1 Environmental Compliance Manager

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

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

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

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

The ECM shall have experience coordinating with relevant regulatory agencies, solving complex environmental coordination and mitigation issues and achieving environmental compliance of projects with similar permitting challenges, including the following:

a) Developing and managing a SW3P;

b) Developing and managing a hazardous substance and petroleum products management plan;

c) Implementing environmental mitigation plans; and

Providing environmental and personal protection training. The ECM's qualifying experience must demonstrate familiarity with:

a) The scope and terminology of ASTM E 1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*;

b) The scope and terminology of the ASTM E 1903-11 *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process*; Provisions of the TPDES Construction General Permit (TXR 150000);

c) THC requirements for discovery of historic or cultural materials; and

d) General conditions and provisions of the USACE and USCG permits.

4.4.2 Environmental Training Staff

Under the direction of the ECM, the Environmental Training Staff shall develop, schedule and conduct environmental awareness and environmental compliance training for Developer's personnel. All training shall be in accordance with the requirements set forth in Section 4.3.3. Environmental Training Staff members shall have at least one year of experience providing environmental compliance inspection for freeway construction.

4.4.3 Environmental Compliance Inspectors

The Environmental Compliance Inspectors (ECI) shall conduct on-Site environmental monitoring, prepare documentation, and report to the ECM daily all violations, compliance, and noncompliance with Environmental Approvals.

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

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

4.4.4 Cultural Resource Management Personnel

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

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

4.4.5 Natural Resource Biologist

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

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

4.4.6 Water Quality Specialist

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

The Water Quality Specialist shall have verifiable experience implementing Storm Water Pollution Prevention Plans and be able to demonstrate a working knowledge of the Texas Pollutant Discharge Elimination System and MS4 permit requirements applicable to the Project.

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

4.4.7 Hazardous Materials Manager

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

a) Schedule and/or conduct training for Developer's employees.

b) Verify all employee certifications prior to and required for any handling of Hazardous Materials.

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

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

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

b) TCEQ guidance for the investigation and remediation of Hazardous Materials under the TCEQ Voluntary Cleanup Program, Texas Risk Reduction Program, and the TCEQ Petroleum Storage Tank Program Rules.

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

4.5 Property Access

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

4.6 Dust Control

Developer shall institute dust control measures to minimize air quality impacts and adjust such measures as necessary based on construction traffic, forecasted wind speeds, and persistent dry weather conditions.

Dust control measures shall include a combination of watering, chemical stabilization and construction vehicle speed reduction (not to exceed 20 mph).

Developer shall identify and discontinue all dust creating construction activities when winds reach a constant velocity of 25 mph or more.

Developer shall keep concrete traffic barriers and any other Elements that can cause accumulation of dust, sand and debris (such as retaining walls, bridge columns and drainage walls) within the Project limits clean of dust, sand and debris during construction.

Developer shall prevent, control, and mitigate fugitive noxious or toxic vapors or particulate matter (dust) during disturbance of noxious or hazardous materials and media.

4.7 Asbestos Containing Material

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

4.8 Lead Containing Paint

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

4.9 Other Hazardous Materials

Developer shall test, identify, inspect, notify, amend notifications as necessary, pay notification fees and abate for any other hazardous materials encountered within the project limits, in accordance with appropriate or relevant regulations or guidance.

5 THIRD PARTY AGREEMENTS

5.1 General Requirements

TxDOT has existing agreements with local and federal Governmental Entities within the Project limits that define the requirements for construction, maintenance, and operation of traffic signals, illumination, and roadway maintenance. These agreements specify the local Governmental Entities' responsibilities and TxDOT's responsibilities with respect to the requirements and are provided as attachments to the Technical Provisions or in the RID.

.

With respect to the Municipal Maintenance Agreement (Attachment 5-1): (i) Developer shall provide such assistance as TxDOT may require in connection with TxDOT's administration of this agreement; (ii) Developer shall facilitate TxDOT and /or the applicable third party's performance of the responsibilities and duties identified in this agreement including the provision of access; and (iii) where the Contract Documents assign a duty or responsibility to Developer, this shall take precedence over any differing assignment of duty or responsibility under the third party agreement:

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

a) Attachment 5-2, NPDES Permit.

b) Attachment 14-2, Railroad Agreement between UPRR and TxDOT.

5.2 Traffic Signals

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

Developer shall comply with Section 5.1 with respect to third party agreements for traffic signals.

5.3 Roadway Illumination

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

5.4 Other Affected Third Parties

When Work interfaces with other third party facilities, Developer is responsible for coordinating the Work with all third parties potentially affected by the Work. Developer shall prepare a plan, the Affected Third Parties Plan, which describes how Developer will mitigate the impact of the Work upon potentially impacted third parties, for TxDOT's review prior to initiating discussions with potentially impacted third parties. Coordination with third parties may include, but is not limited to impacts to ROW, utilities, drainage, parks, Railroad, and the Port.

6 UTILITY ADJUSTMENTS

6.1 General Requirements

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

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

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

Developer's obligations regarding reimbursement to Utility Owners for eligible costs of Utility Adjustment Work, and Developer's obligations regarding the accommodation of Utilities from and after NTP2, are set forth in Sections 3.13.1 (a) (New Utilities) and 3.13.6 of the Agreement.

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

6.1.1 When Utility Adjustment is Required

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

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

Pipelines and overhead electric lines, located on an existing compensable property interest, that are not in physical conflict with the Project but that cross the mainlane centerline at less than 90 degrees, may remain in the existing alignment, as long as the Utility facility crosses at no less than a 30 degree angle to the mainlane centerline and does not cross diagonally through connecting intersections. The pipelines and overhead electric lines may remain or be relocated in place in these areas only if all conditions of the Utility Accommodation Rules (UAR) are met, other than the 90 degree reference in the UAR. The affected Utility Owners must agree and approve all proposed Utility Adjustment plans.

6.1.2 Certain Components of the Utility Adjustment Work

6.1.2.1 Coordination

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

All Utility Agreements must be approved by TxDOT prior to any utility adjustment construction related activity.

6.1.2.2 Betterments

Replacements for existing Utilities shall be designed and constructed to provide service at least equal to that offered by the existing Utilities, unless the Utility Owner specifies a lesser replacement. Utility Enhancements are not included in the Work; however, any Betterment work furnished or performed by Developer as part of a Utility Adjustment shall be deemed added to the Work, on the date the Utility Agreement becomes effective as set forth in Section 3.13.2 of the Agreement. Developer shall perform all coordination necessary for Betterments.

6.1.2.3 Protection in Place

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

6.1.2.4 Abandonment and Removal

Developer shall make all arrangements and perform all work necessary to complete each abandonment or removal (and disposal) of a Utility in accordance with the requirements listed in Section 6.2.1 (Standards), including obtaining Governmental Approvals and consent from the affected Utility Owner and any affected landowner(s), or shall confirm that the Utility Owner has completed these tasks. Abandonment of Utilities in place shall require Approval by TxDOT.

6.1.2.5 Service Lines and Utility Appurtenances

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

6.1.2.6 Early Adjustments

Not used.

6.1.3 Agreements Between Developer and Utility Owners

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

6.1.3.1 Project Utility Adjustment Agreements (PUAA)

Developer shall enter into one (1) or more PUAAs with each affected Utility Owner to define the design, material, construction, inspection, and acceptance standards and procedures necessary to complete Utility Adjustments, as well as to define Developer's and the Utility Owner's respective responsibilities for Utility Adjustment costs and Utility Adjustment activities such as material procurement, construction, inspection, and acceptance. A PUAA may address more than one (1) Utility Adjustment for the same Utility Owner. Additional Utility Adjustments may be added to an existing PUAA by a Utility Adjustment Agreement Amendment (UAAA).

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

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

Developer shall obtain Approval by TxDOT of any language modification to a PUAA by the Utility Owner and Developer prior to the submission of a Utility Assembly.

6.1.3.2 Utility Adjustment Agreement Amendments

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

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

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

6.1.4 Recordkeeping

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

6.2 Administrative Requirements

6.2.1 Standards

All Utility Adjustment Work shall comply with all applicable Laws, Codes (including, but not limited to 43 TAC, Part 1, Chapter 21, Subchapter C, Utility Accommodation Rules), Regulations and Technical Provisions of the Agreement, including the Utility Adjustment Standards, the TxDOT *ROW Utility Manual*, Section 3.13 of the Agreement, and the requirements specified in this Section 6.

6.2.2 Communications

6.2.2.1 Communication with Utility Owners

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

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

6.2.2.2 Meetings

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

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

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

b) Documentation of the issues discussed and any associated solutions

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

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

6.2.3 Utility Adjustment Team

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

The UM's primary work responsibility shall be the performance of all Developer's obligations with respect to Utility Adjustments. The Utility Manager shall have a bachelor's degree, and have at least five (5) years of relevant experience in coordinating and solving complex utility adjustments on highway improvement projects. Developer shall authorize the Utility Manager to approve all financial and technical modifications associated with Utility Adjustments, and modifications to the Utility Agreement.

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

6.2.4 Real Property Matters

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

6.2.4.1 Documentation of Existing Utility Property Interests -- Affidavits

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

6.2.4.2 Acquisition of Replacement Utility Property Interests

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

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

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

- The files and records must be kept separate and apart from all acquisition files and records for the Project ROW.
- The items used in acquisition of Replacement Utility Property Interests (e.g., appraisals, written evaluations and owner contact reports) must be separate from the purchase of the Project ROW.
- Any Developer-Related Entity personnel negotiating the acquisition of Replacement Utility Property Interests must be different from those negotiating the acquisition of Project ROW.

Developer is not responsible for Utility Owner condemnation proceedings except for Developer's cost share set forth in Section 3.13.6 of the Agreement. The Utility Owner is responsible for utilizing its authority for condemnation proceedings for all Replacement Utility Property Interests.

6.2.4.3 Relinquishment of Existing Utility Property Interests

Developer shall cause the affected Utility Owner to relinquish each Existing Utility Property Interest within the Project ROW, unless the existing Utility occupying such interest is either (i) remaining in its original location or (ii) being reinstalled in a new location still subject to such interest.

6.2.4.4 Quitclaim Deeds

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

Developer understands and expects that a Utility Owner will not relinquish any Existing Utility Property Interest until after the Utility Adjustment has been accepted by the Utility Owner in its new location. Accordingly, instead of an executed Quitclaim Deed, the Utility Assembly for such a Utility Adjustment shall include a letter signed by the Utility Owner's authorized representative confirming that the interest will be quitclaimed upon completion of the Utility Adjustment, and a copy of the unsigned Quitclaim Deed. In these cases, Developer shall obtain the executed Quitclaim Deed within 90 Days of completion of the Utility Adjustment or unless otherwise approved by TxDOT in writing. The Quitclaim Deed must be approved by TxDOT prior to recording such deed.

6.2.4.5 Utility Joint Use Acknowledgements and Notice of Installation, Form 1082 Requirements

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

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

Developer shall prepare a Utility Installation Request, Form 1082 for each Utility that will remain or be relocated within the project ROW and is not located within an existing compensable property interest held by the Utility Owner.

6.2.4.6 Documentation Requirements

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

6.3 Design

6.3.1 Developer's Responsibility for Utility Identification

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

Developer shall prepare and submit to TxDOT, no later than 90 days after NTP2 or 30 days before the first assembly package is submitted, a Utility Strip Map showing the information obtained and/or confirmed pursuant to this Section 6.3.1. Developer’s Utility Strip Map shall show, in plain view, all

Utilities within the Project ROW or otherwise impacted by the Project, in each case detailing the type of Utility facility (e.g., communication, gas, oil, water) size, material and the Utility Owner's name and contact information. The scale of the Utility Strip Map shall be 1"=100'. Developer shall update the information provided in the Utility Strip Map with SUE data and shall submit the same to TxDOT in accordance with the PMP.

6.3.2 Technical Criteria and Performance Standards

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

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

b) The Project design

c) Any existing and proposed utility facility

d) All applicable Governmental Approvals

e) Private Approvals of any third parties necessary for such work

6.3.3 Utility Adjustment Concept Plans

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

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

6.3.4 Utility Adjustment Plans

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

6.3.4.1 Plans Prepared by Developer

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

Unless otherwise specified in the applicable Utility Agreement(s), all changes to Utility Adjustment Plans previously approved by the Utility Owner (excluding estimates, if the Utility Owner is not responsible for any costs) shall require written Utility Owner Approval. Developer shall transmit any TxDOT comments

to the Utility Owner, and shall coordinate any modification, re-Approval by the Utility Owner and re-submittal to TxDOT as necessary to obtain TxDOT's Approval.

6.3.4.2 Plans Prepared by the Utility Owner

For all Utility Adjustment Plans to be furnished by a Utility Owner, Developer shall coordinate with the Utility Owner as necessary to confirm compliance with the applicable requirements as referenced in Section 6.2.1. Those Utility Adjustment Plans shall be attached to the applicable Utility Agreement, which Developer shall include in the appropriate Utility Assembly for TxDOT's Approval. Developer shall transmit any TxDOT comments to the Utility Owner, and shall coordinate any modification, review by Developer and re-submittal to TxDOT as necessary to obtain TxDOT's Approval.

6.3.4.3 Design Documents

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

6.3.4.4 Certain Requirements for Underground Utilities and Bridge Attachments

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

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

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

Utilities shall not be attached to bridges, except Utilities that serve a bridge or highway facilities on bridges. See Section 13.2.1.17.

6.3.4.5 Utility Assemblies

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

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

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

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

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

b) A completed Utility Assembly Checklist.

c) A TxDOT approved Utility Adjustment Agreement.

d) Plans which:

- Show the existing and proposed Utility facilities,
- Show existing and proposed grades for all utility crossings,
- Show the existing and Project ROW lines along with the Control of access denial line,
- Show an offset distance from the Project ROW line to all longitudinal Utilities within the Project ROW.
- Present sufficient information to enable TxDOT to verify compliance with the UAR requirements for each Utility located within the Project ROW, including highway design features.
- Are folded to 8.5" x 11" size unless waived by TxDOT.

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

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

g) Statement of Work form, if applicable

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

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

j) All Utility No Conflict Sign-Off Forms.

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

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

Abbreviated Utility Assemblies. Developer shall prepare an Abbreviated Utility Assembly for each Utility proposed to remain at its original location within the Project ROW that is not required to be addressed in a PUAA or UAAA, unless an Adjustment is required pursuant to Section 6.1.1. If Developer is reimbursing the Utility Owner any of its costs, a PUAA or UAAA is required. Each Abbreviated Utility Assembly shall contain a transmittal memo recommending that the subject Utility(ies) remain in place, a

set of plans detailing UAR compliance, a completed Utility Assembly Checklist, a certification from the Utility Owner approving leaving the Utility(ies) in place, as well as Utility Joint Use Acknowledgment(s) or Utility Installation Request, Form 1082 as required in Section 6.2.4.5, Utility No Conflict Sign-Off Forms, plans detailing UAR compliance and Affidavit(s) of Property Interest, if applicable. Each of the foregoing items shall comply with the requirements for same described in Attachment 6-1.

6.4 Construction

6.4.1 Reserved

6.4.2 General Construction Criteria

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

a) All criteria identified in Section 6.3.2 (Technical Criteria and Performance Standards)

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

c) All Project safety and environmental requirements

d) All pre-construction meeting requirements

e) The ROW acquisition schedule described in Section 7 (ROW)

f) Utilities standards provided in the Utility Agreement

6.4.2.1 Reinstatement of Utility Cuts

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

6.4.3 Inspection of Utility Owner Construction

Developer shall set forth procedures in the PMP for inspection of all Utility Adjustment Work performed by Utility Owners (and/or their contractors) to verify compliance with the applicable requirements described in Section 6.4.2 (General Construction Criteria). Developer is responsible for Quality Control and Quality Assurance for all Work performed by the Utility Owners and/or their contractors.

6.4.4 Scheduling Utility Adjustment Work

The Utility Adjustment Work (other than construction) may begin at any time following issuance of NTP1. Refer to Section 3.8.2 of the Agreement for the conditions to commencement construction of a Utility Adjustment Construction Work by Developer. Developer shall not arrange for any Utility Owner to begin any demolition, removal, or other construction work for any Utility Adjustment until all of the following conditions are satisfied:

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

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

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

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

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

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

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

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

6.4.5 Standard of Care Regarding Utilities

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

6.4.6 Emergency Procedures

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

6.4.7 Utility Adjustment Field Modifications

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

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

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

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

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

6.4.8 Switch Over to New Facilities

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

6.4.9 Record Drawings

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

Developer shall provide Record Drawings to TxDOT (regardless of whether design and/or construction of the subject Utilities was furnished or performed by Developer or by the Utility Owner). These drawings shall show the location of, and label as such, all abandoned Utilities, shall show and label all other Utilities, whether remaining in place or relocated, located within the Project ROW or otherwise impacted by the Project, and shall otherwise comply with Section 2 (Project Management). Developer shall provide the Record Drawings for each Adjustment to TxDOT not later than 90 Days after Utility Owner acceptance as defined in the Utility Agreement, the Adjustment or before such earlier deadline as is specified elsewhere in the Contract Documents.

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

6.4.10 Maintenance of Utility Service and Access

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

Each Utility Adjustment or remain in place location must allow for adequate access after completion of the Project to the Utility facility that is agreed to by the Utility Owner.

6.4.11 Traffic Control

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

6.5 Deliverables

Developer shall time all submittals described in this section to meet the Project Schedule, taking into account the maximum number of submittals set forth in this Section 6.5 or, if not stated therein, then as stated in Section 4.1.2 of the Agreement. All deliverables shall conform to the standards required in the Project Management Plan.

6.5.1 Maximum Number of Submittals

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

a) Ten (10) Utility Assemblies (excluding Abbreviated Utility Assemblies); and

b) Ten (10) of any other Submittal required under this Section 6 and requiring TxDOT review and Approval.

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

6.5.2 Developer's Utility Tracking Report

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

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

b) Utility size and type;

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

d) The proposed method of treatment;

e) State whether the adjustment will be Owner or Developer Managed;

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

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

h) The Utility Owner’s existing right of occupancy of the right of way for each Utility (e.g., UJUA, permit, easement or combination);

i) Whether any Replacement Utility Property Interest will be necessary;

j) Estimated cost approved in the PUAA or UAAA;

k) Amounts and dates of payments made by Developer to the Utility Owner, listing in each case the type of payment (final, partial or lump sum);

l) Scheduled start and completion date for construction of each adjustment;

m) Percent complete of construction;

n) Whether any betterment is included in the adjustment

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

6.5.3 Utility Assembly Submittals and Final Closeout Procedures

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

a) Before submitting a Utility Assembly to TxDOT, Developer shall:

   (i) Verify that each subject Utility (or the Utility Owner) is on the approved Alternate Procedure List, if applicable;

   (ii) Submit the complete Utility Assembly to the quality control/quality assurance entity designated by Developer in accordance with the PMP; and

   (iii) Resolve all comments made by the quality control/quality assurance entity, coordinating with the Utility Owner as appropriate.

b) Developer shall submit to TxDOT three (3) identical and complete originals of each Utility Assembly, each of which shall be bound and labeled "Developer Copy," "TxDOT Copy," or "Utility Owner Copy," as appropriate. The "TxDOT Copy" shall be color coded and shall include the Project ROW map with the existing and proposed Utility facilities identified on a plan view. These submittals shall be for TxDOT's review and comment, except for any components of the Utility Assembly for which TxDOT's Approval is required by this Section 6.5.

c) Developer shall submit to TxDOT a Utility Assembly Submittal Log with each Submittal or group of Submittals. The Utility Assembly Submittal Log shall establish the review priority.

TxDOT will review the Utility Assembly for compliance with the requirements of this Section 6.5.3, and within ten (10) Business Days will return the Utility Assembly to Developer with the appropriate notations pursuant to Section 4.1 of the Agreement to reflect its responses. Developer shall transmit any TxDOT comments to the Utility Owner, and shall coordinate any modification, review and Approval by the Utility Owner and re-submittal to TxDOT, as necessary to resolve all TxDOT comments and/or obtain TxDOT's Approval, as applicable. Upon (a) TxDOT's Approval of any Utility Assembly components for which TxDOT's Approval is required, and (b) completion of the review and comment process for all other Utility Assembly components, TxDOT will sign three originals of any approved UJUA and of any other components of the Utility Assembly for which this Section 6 requires TxDOT's signature.

Developer shall provide closeout information and documentation within 90 days after each Utility has been relocated, fully reimbursed and accepted by the Utility Owner. The closeout information must contain the following:

a) The Utility Agreement form (PUAA, UAAA, et al);

b) "As-built" plans;

c) UJUA or Form 1082;

d) Quitclaim form (D-15-30); and

e) Actual cost of the Adjustment.

Developer shall address conditions of Approval, if any, for each Utility Assembly prior to completing the final closeout procedure.

6.5.4 FHWA Alternate Procedure

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

Developer shall submit to TxDOT all documentation as referenced above in order to update the Alternative Procedure List.

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

7 RIGHT OF WAY (ROW)

7.1 General Requirements

Developer's obligations in respect of the acquisition of Project ROW are set forth in Section 3.12 of the Agreement.

This Section 7 sets forth the ROW activities assigned to Developer, including pre-acquisition and acquisition activities, and designates which ROW activities TxDOT will conduct. This section also sets forth the requirements applicable to the Work assigned to Developer related to the acquisition of Project ROW. Developer shall provide all services necessary to acquire title to the Project ROW, in form and substance acceptable to TxDOT, in the name of the State; relocation of displacees; and clearance/demolition of the improvements from the Project ROW, as more fully described in the following subsections.

Except as otherwise set forth in the Agreement, Developer's Project ROW staff and/or Subcontractors will function as independent contractors while acquiring Project ROW, and not as an agent, representative, or employee of TxDOT.

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

7.2 Administrative Requirements

7.2.1 Standards

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

a) TxDOT *Right of Way Manual* Collection (available online at http://onlinemanuals.txdot.gov/manuals)

b) TxDOT *Access Management Manual* (available online at http://onlinemanuals.txdot.gov/manuals)

c) *TxDOT Survey Manual*

d) TxDOT *ROW Appraisal and Review Manual*

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

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

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

7.2.2 Software Requirements

Developer shall employ software that is fully compatible with the software in use by TxDOT, or fully transferable to TxDOT's systems. Developer must supply and maintain parcel-by-parcel status information that incorporates the fields and information required by TxDOT's ROW tracking system: ROWIS. Developer must maintain and participate in any other required ROW tracking system required by the Contract Documents. The database shall be fully accessible to Persons authorized by TxDOT.

7.2.3 ROW Acquisition Plan

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

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

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

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

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

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

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

b) Provide administrative support.

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

d) Provide documentation and reports.

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

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

g) Prevent fraud, waste, and mismanagement.

Developer shall update the ROW Acquisition Plan regularly, at least quarterly, in accordance with the Contract Documents.

7.2.4 Schedule and Review Procedures

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

In developing the Project Schedule, Developer shall incorporate adequate time periods for TxDOT review and Approval of Acquisition Packages and Condemnation Packages. TxDOT intends to review the

completed Acquisition Packages and Condemnation Packages as expeditiously as possible; however, for the purposes of the Project Schedule, Developer shall assume that the reviews performed by TxDOT will require ten (10) Business Days for Acquisition Packages and Condemnation Packages (collectively) that Developer submits as final and complete in accordance with Section 7.3.6 (Project ROW Acquisition Package Approval) and Section 7.4.4 Item 6 (Condemnation Support), up to a maximum of twenty five (25) Acquisition Packages and Condemnation packages (collectively). Any Submittals that would require TxDOT to review more than twenty five (25) Acquisition Packages and Condemnation Packages (collectively) within any given ten (10) Business Day period shall be considered excess, and TxDOT may defer its review of any such Acquisition Packages and/or Condemnation Packages to a subsequent ten (10) Business Day period (or periods as necessary). TxDOT will notify Developer of its election to defer any excess Acquisition Packages and/or Condemnation Packages within ten (10) Business Days after receipt. The balance of Acquisition Packages and Condemnation Packages (collectively) in excess of twenty five (25) will be rolled over to the next ten (10) Business Day period and added to the Acquisition Package and Condemnation Package Submittals made by Developer in that period. When Developer submits more than twenty five (25) Acquisition Packages and Condemnation Packages (collectively) at any given time, Developer shall indicate the priority of review.

Developer shall also assume that the reviews performed by TxDOT will require ten (10) Business Days for the following submittals: payment submittals, relocation submittals, administrative settlement submittals, and closing submittals, up to a maximum of twenty five (25) submissions for each type of submittal noted above, in addition to the Acquisition Packages and Condemnation Packages.

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

TxDOT reserves the right to undertake additional review on Acquisition Packages and/or Condemnation Packages that contain or identify facts or issues of an unusual nature or which do not clearly fit within TxDOT standards and will notify Developer in writing that the review period will be extended by an additional ten (10) Business Days before rendering a decision to Developer.

Developer may request TxDOT to do a preliminary review of the survey, Project ROW map and appraisal before the complete Acquisition Package is submitted. TxDOT may elect in its sole discretion to review the preliminary submission of the survey, map and appraisal and notify Developer of any deficiencies after TxDOT's receipt and review of such preliminary submission.

7.2.5 Developer's Project ROW Scope of Services

Developer shall complete all administrative activities and prepare all documentation sufficient for Developer to acquire the Project ROW. Developer shall obtain TxDOT's review and prior written Approval of all Project ROW maps and surveys, appraisals, legal descriptions, acquisition documentation, purchase price, requests to acquire Project ROW, condemnation-related activities, and funding/closing procedures. TxDOT will (i) approve and return the Project ROW acquisition documentation, (ii) provide review comments for incorporation by Developer in accordance with Section 7.2.4 (Schedule and Review Procedures), or (iii) in the case of an Acquisition Package that is deficient, notify Developer of the deficiency(ies) to be corrected by Developer in accordance with Section 7.2.4. Except as otherwise authorized by applicable State and federal policy and regulations for early acquisition and approved by TxDOT, Developer shall not proceed with acquisition of the Project ROW until the NEPA Approval is

issued, public involvement procedures have been completed, and ROW maps and legal descriptions for the applicable constructible segment as established by the logical termini of the Project have been prepared and approved by TxDOT. TxDOT will provide a separate release for each approved segment. Further, Developer shall not commence any negotiations with landowners nor will TxDOT begin eminent domain procedures until the specific Acquisition Package for that particular parcel is approved by TxDOT.

If Developer and the landowner cannot negotiate an agreed-upon conveyance by deed, due to any specific issue (such as deed language, land/improvements value, damages to remainder), acceptable to TxDOT, TxDOT will initiate acquisition of the property through eminent domain procedures. Developer shall not be permitted to commence any condemnation action through the statutory "Declaration of Taking" procedure without the express written consent of TxDOT. Consent may be withheld in TxDOT's sole and absolute discretion.

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

7.2.6 Acquisition Process Summary

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

a) Project ROW surveying and mapping

b) Project ROW budget estimates and updates

c) Title services

d) Appraisal services

e) Appraisal review

f) Negotiations

g) Closing services

h) Relocation assistance

i) Condemnation support services

j) Clearance and demolition of Project ROW

k) Environmental due diligence

l) Documentation and document control

m) Progress reports

n) Project ROW administration and management

o) Project ROW quality management

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

q) Obtaining rights of entry, as necessary

7.2.7 ROW Personnel Qualifications

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

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

Appraiser and Appraisal Reviewer – Each appraiser and appraisal reviewers shall be licensed and certified in the State of Texas and shall have a minimum of five (5) years' experience in appraising real property for eminent domain purposes, including partial taking appraisal, partial taking appraisal review and expert witness testimony. He or she must also have been actively and continuously engaged for at least three (3) years immediately preceding his or her selection for this Project in appraisal work primarily in Nueces County, or as approved and precertified by TxDOT. The appraisers and the appraisal reviewers shall have separate and distinct duties, and appraisers must be employed by different firms from the appraisal reviewers. Each appraiser shall be required to submit three (3) samples of previous appraisal work prepared for eminent domain purposes. All appraisers preparing and signing appraisals must be approved and precertified by TxDOT before performing any appraisals on the Project. If required by TxDOT, the appraiser will be required to demonstrate his/her skills at expert witness testimony.

Land Planner - Each land planner shall have a minimum of five (5) years' experience in land planning including experience with expert witness testimony in eminent domain proceedings. He or she must also have been actively and continuously engaged for at least three years immediately preceding his or her selection for this Project in land planning work primarily in Nueces County, or as approved and precertified by TxDOT. Developer shall provide a minimum of two (2) land planners to assist appraisers and complete land plans.

Relocation Agent - Each relocation agent shall have a minimum of three (3) years' experience in relocation assistance for ROW projects pursuant to the Uniform Act. A relocation agent's responsibilities shall include the following: Determination of eligibility of all displacees, contacting all displacees and informing them of their benefits, maintaining a file of all documentation concerning the relocation of the displacees, and extending all relocation assistance advisory services.

Negotiator - Each ROW negotiator shall be licensed either as a real estate sales person or broker pursuant to the *Texas Real Estate License Act* or rules established by the Texas Real Estate Commission, and shall be familiar with appraisal and appraisal report review pursuant to the USPAP. The negotiator shall have a minimum of three (3) years' experience in right of way negotiations. The ROW negotiator's responsibilities shall include the following: contact with property owners on the Project to discuss the acquisition of property needed for the Project, maintaining complete and accurate files of all transactions and contacts with the property owners and/or their representatives, and actively working toward a joint resolution to acquire the property with the property owner.

Eminent Domain Specialist – Each eminent domain specialist shall have a minimum of three (3) years' experience with TxDOT procedures and policies as related to acquisition of property through the use of eminent domain. The eminent domain specialist must be well versed in all activities necessary with the acquisition of parcels through the TxDOT Eminent Domain process. This includes correctly completing all TxDOT forms including the ROW-E-49, filing the eminent domain forms, coordinating the hearing

with all appropriate parties and ensuring that the Award of Special Commissioners is deposited into the registry of the Court and all notices sent to the appropriate parties.

Real Estate Attorney - Each real estate attorney shall be licensed by the State of Texas and shall have at least five (5) years' experience in title review and curative matters. The real estate attorney's responsibilities shall include coordinating and clearing all title issues, and compliance assistance with State and federal acquisition requirements for the properties acquired for the Project.

ROW personnel shall have at least three (3) years' experience in title review and curative matters. ROW personnel's responsibilities shall include, but not be limited to the following: maintain complete and accurate files of all transactions and contacts with the property owners and/or their representatives, coordinate and clear all title issues and assist at closing for properties acquired for the Project.

7.2.8 Developer Conflict of Interest

If at any time, Developer or to the best of Developer's knowledge, any Developer-Related Entity directly or indirectly (i) acquires or has previously acquired any interest in real property likely to be parcels of the Project ROW or the remainders of any such parcels; (ii) loans or has previously loaned money to any interest holder in any real property likely to be a Project ROW parcel and accepts as security for such loan the parcel, or the remainder of any such parcel that is not a whole acquisition, or (iii) purchases or has previously purchased from an existing mortgagee the mortgage instrument that secures an existing loan against real property likely to be a Project ROW parcel, or the remainder of any such parcel, Developer shall promptly disclose the same to TxDOT. In the case of acquisitions, loans or mortgage purchases that occurred prior to the execution of the Agreement, such disclosure shall be made within ten (10) days after execution of the Agreement.

In the event that Developer, or any subsidiary or parent company of Developer, acquires a real property interest, whether title or mortgage, in parcels of the Project ROW, the real property interest acquired or a release of mortgage as the case may be, shall be conveyed to the State of Texas without the necessity of eminent domain.

Developer shall not acquire or permit the acquisition by Developer or any Developer-Related Entity of any real property interest in a Project ROW parcel, whether in fee title or mortgage, for the purpose of avoiding compliance with the Laws, practices, guidelines, procedures and methods described in Section 7.2.1 (Standards).

7.2.9 Meetings

Developer shall attend meetings as requested by TxDOT. At such meetings Developer shall provide exhibits, take minutes, and distribute the minutes to all attendees for review and comment. Minutes will not be finalized until all attendees agree on content. Developer shall provide meeting minutes to TxDOT within five (5) Business Days from the date of the meeting. TxDOT will respond within five (5) Business Days or at the next occurrence of the meeting. Developer shall provide proposed agendas three (3) Business Days prior to each meeting.

7.2.10 Documentation and Reporting

Developer shall provide TxDOT with all specific reports and supporting documentation for review and Approval during the acquisition process. All correspondence with TxDOT and property owners relating to acquisition of real property shall include a heading with the following information (at a minimum):

a) County

b) Control Section Job (CSJ) number

c) Right-of-Way Control Section Job (RCSJ) number

d) Federal Project Number (if applicable)

e) Highway Designation

f) Project limits

g) Parcel number

h) Name of record owner(s)

i) Developer shall utilize TxDOT's approved naming convention for all electronic files and reporting fields.

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

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

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

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

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

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

f) Input and update parcel status in TxDOT approved web-based tracking system or as directed by TxDOT.

7.2.11 Responsibilities of Developer

As set forth in Section 3.12.4 of the Agreement and as more fully described in this section, Developer shall be responsible for the costs of all services and preparation of all documentation for all Project ROW acquisition, easement acquisition, permitting and related relocation assistance for the Project. The Work related to Project ROW acquisition includes mapping, surveying, environmental assessment, testing and remediation, appraisal, appraisal review, negotiation, acquisition, relocation advisory assistance and determination of relocation benefits to be provided, procurement of title insurance, clearing of title, closing of acquisitions, condemnation support including expert witnesses required by TxDOT and/or the Office of the Attorney General for all condemnation proceedings through special commissioner's hearings. Developer shall also be responsible for all expert witness testimony, exhibits, transcripts, and photos associated with condemnation services and proceedings required by the Office of the Attorney General or TxDOT for special commissioner's hearings, jury trials and appeals, through Final Acceptance of the construction project or through any comprehensive lease, maintenance and/or operation agreement Term periods, whichever is longer.

Developer shall not contact the Office of the Attorney General or an Assistant Attorney General handling a specific parcel that has been filed for eminent domain action or is in the process of settlement unless authorized by TxDOT.

Developer acknowledges that Developer has incorporated the value of saleable improvements into Developer's Project ROW costs, and Developer shall concurrently, with conveyance of the real property interest to the State of Texas, and without the necessity of further documentation executed by the State, obtain the rights to said saleable improvements. Developer shall not be entitled to a credit for any improvements retained by a property owner. Upon conveyance of the real property interest to the State of Texas, Developer shall comply with all applicable Laws with respect to relocation assistance and demolition.

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

Developer shall be responsible for processing payment submittals for request of payments and distributing all payments of: agreed purchase prices or court awards and judgments; special commissioner's awards; relocation assistance payments; all legal, administrative, and incidental expenses of, or related to, Project ROW.

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

Developer's cost shall include all costs not paid by TxDOT.

Developer shall also be responsible for submitting the completed files in accordance with the closeout procedures as defined by TxDOT within 90 days of the completed ROW activity. Developer shall provide the following documentation including, but not limited to:

(a) Appraisal report(s) (initial appraisal and all other issued appraisal reports, approved and/or not approved, with most recent appraisal report on top);

(b) Conveyance document (PUA(s), deed(s), easement(s), judgment(s), Award of Commissioners);

(c) Title Insurance Policy or Attorney's Certificate;

(d) Memorandum of Agreement; and

(e) Negotiator's Certificate.

For relocation and general correspondence, the following shall be included:

(a) Relocation files (in chronological order);

(b) Offer Letters;

(c) Negotiator Reports and/or Contact Sheets;

(d) General correspondence; and

(e) All other documentation regarding the parcel.

7.2.12 Responsibilities of TxDOT

TxDOT will have the following responsibilities in connection with acquisition of Project ROW:

a) Except as otherwise set forth in this Section 7, provide final Approval for all Acquisition Packages, Condemnation Packages, and payment submittals relocation eligibility, relocation appeals, relocation submittals, administrative settlement submittals, closing submittals, court settlement requests, and other Approvals required by the Contract Documents, by the State, or by applicable Law subject to submission requirements and timelines in Section 7.2.4 (Schedule and Review procedures).

b) After receiving a complete Condemnation Package from Developer in accordance with Section 7.4.4 (Condemnation Support), and Section 7.2.4 (Schedule and Review procedures), TxDOT will submit a minute order request on the agenda of the next scheduled Texas Transportation Commission meeting; provided the completed Condemnation Package is submitted ten (10) Business Days before the Commission's required deadline for eminent domain minute order requests.

c) After receiving a complete payment submittal from Developer in accordance with Section 7.4.6 (Payment Submittal), and Section 7.2.4 (Schedule and Review procedures), TxDOT will submit a payment request to the Comptroller's Office. Upon receipt of the State warrant, TxDOT will relay the State warrant to Developer within (5) five Business Days.

d) TxDOT will coordinate with the Office of the Attorney General to provide legal counsel to prepare and deliver to TxDOT the condemnation petition within 20 Business Days after the Attorney General's receipt of the condemnation packet, including Commission minute order Approval. TxDOT will deliver the condemnation petition to Developer within ten (10) Business Days after receipt of the condemnation petition from the Office of the Attorney General.

e) If applicable, TxDOT will provide all e-filed documents to Developer as part of Developer's support of condemnation process and invoice Developer for all e-filed charges. Developer is responsible for reimbursing TxDOT all e-filed invoices.

f) TxDOT will provide all coordination services between Developer and the Office of the Attorney General for prosecution of jury trials.

g) TxDOT will provide a ROW Administrator to serve as the point of contact for all Project ROW issues as set forth in 23 CFR § 710.313(d). TxDOT will facilitate an office for review of all submissions as described above and will have ultimate Approval authority for said submissions.

h) TxDOT will review and approve the completed, final closeout files in accordance with the closeout procedures.

7.2.13 TxDOT Project Monitor/Reviewer

In addition to its review and Approval authority as expressly set forth in other provisions of this Section 7, TxDOT may, at its sole discretion, audit and/or monitor the ROW activities and services performed by Developer. TxDOT may contract with independent consultants to assist it in fulfilling the audit/monitoring function provided that the audit authority is not delegated. In addition to any of the matters specifically required to be provided by Developer to TxDOT pursuant to the foregoing sections, Developer shall provide information to TxDOT as requested to assist in its review and assessment of the progress, timeliness, adequacy, or sufficiency of Developer's Project ROW activities.

7.2.14 Responsibilities of the Office of the Attorney General

The Office of the Attorney General, with the assistance of Developer and coordination of TxDOT, shall be responsible for implementing all necessary legal actions for acquiring and obtaining possession of the Project ROW (and any necessary temporary construction easements approved by TxDOT for acquisition by condemnation) through the eminent domain process and eviction process. The responsibilities of the Office of the Attorney General will include:

a) Represent TxDOT as the State's Attorney of Record

b) Preparation of complete petitions for condemnation with the appropriate court for a cause number to be assigned

c) If applicable, e-file condemnation documents and coordinate delivery of filed documents with TxDOT.

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

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

f) Additional legal advice and opinions as needed by TxDOT

g) Special commissioners' hearings

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

i) Preparation, obtaining, and filing of all necessary legal documentation for eviction of property owners or tenants.

7.3 Pre-Acquisition Activities

7.3.1 Project ROW Surveying and Mapping

Developer shall perform all Project ROW surveying and mapping and shall prepare Project ROW documents in accordance with applicable TxDOT Standards, including the TxDOT *Right of Way Manual*, the *TxDOT Survey Manual*, and the *TxDOT GPS User's Manual* for any Additional Properties. Developer shall refer to the current *Manual of Practice* by the Texas Society of Professional Land Surveyors and the *US National Map and Accuracy Standards*. Developer shall refer to Section 9 (Land Surveying) for additional survey requirements.

The Project ROW map shall be prepared by Developer and submitted to TxDOT for review and Approval. The Project ROW map may be prepared in separate constructible segments established by the logical termini of the Project. TxDOT shall have ten (10) Business Days for review of each submitted ROW map, each containing up to a maximum of 25 parcels. Any submittals that would require TxDOT to review more than 25 parcels within any given ten (10) Business Day period shall be considered excess, and TxDOT may defer its review of any such excess parcels to a subsequent ten (10) Business Day period (or periods as necessary).

Developer may use Acquisition Survey Documents prepared by TxDOT, if available, for the purpose of performing ROW acquisition work at Developer's risk.

Developer shall assemble an Acquisition Survey Document to be included in the submission of the Acquisition Package. The Acquisition Survey Document shall include:

a) Three (3) half size right of way maps on paper, Scale 1"= 100' (11"X 17").

b) One (1) separate set of Originals signed and sealed by RPLS, legal descriptions and parcel sketch, traverse closure sheets and a copy of the parent track deeds and subdivision plat if tract is a platted lot.

c) A CD with DGN Master File, Map Sheets, Excel Point List and Raw Data File and/or Field Notes and scanned copies of the instruments of record or other pertinent documents.

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

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

f) Three (3) copies (signed and sealed) of each legal and sketch.

g) One (1) separate set (copies) of legal and sketch of each parcel for TxDOT records.

h) One (1) separate set (copies) of legal and sketch of each parcel for Title Company.

i) One (1) separate set of Originals legal and sketch signed and sealed by R.P.L.S. to be kept in mapping files.

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

a) Developer shall assemble an Acquisition Survey Document. The Acquisition Survey Document shall include the Project ROW map, a parcel (metes and bounds) description, and a parcel plat, with a closure report for each of these three items for each of the parcels to be acquired. The latter three (3) items shall be on standard 8½" x 11" bond paper. The Project ROW map sheets shall be on 22" x 34" paper. Each final submission to TxDOT shall include two (2) sets of each document, unless otherwise directed. Each map sheet and document page shall have an "as of" date near the lower right hand corner. The parcel plat and parcel description for a given parcel should show identical "as of" dates.

b) The ROW map sheet and plat shall show all areas of denied access for the parcel according to the current TxDOT *Access Control Management Manual* and amendments.

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

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

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

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

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

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

i) All Project ROW maps (and on the title sheet) and all parcel descriptions (at the end of the description) shall include a notation that identifies the State Plane Coordinate System and UTM

zones, datum (NAD83) (1993 adj), or as shown on the current ROW maps, and the Project grid-to-surface coordinate adjustment factor or refer to Primary Project Controls provided by TxDOT (refer to Section 9.3).

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

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

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

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

n) All visible improvements (buildings and structures) within 50 feet outside of the proposed Project ROW line shall be located by an "on-the-ground" survey and documented on the Project ROW map sheets and the parcel plats by measured offset distance from the proposed Project ROW line. Clearly indicate which distances are surveyed on–the-ground.

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

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

q) Upon final submittal from Developer of the Project ROW documents to TxDOT, Developer shall cause the surveyor to mark on the ground, using permanent and stable monuments as defined in Section 663.17 of the General Rules of Procedures and Practices of the Texas Board of Professional Land Surveying (TBPLS), all significant points along the Project ROW line, as described above, and all property line intersections with the Project ROW line. TxDOT requires these monuments to be a 5/8-inch iron rod, at least 18 inches in length, and including an aluminum cap stamped "Texas Dept. of Transportation – Property Corner" (rod-and-cap monument).

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

s) As part of the survey process, Developer shall cause a TxDOT Type II monument to be constructed at all significant points such as PCs, PTs, angle points and at 1500 foot intervals along tangent sections on the Project ROW line and at intersections with existing Project ROW lines, replacing monuments as described above, unless directed by TxDOT. Project ROW line intersections with property lines may remain monumented by a 5/8-inch iron rod with a TxDOT aluminum cap (rod-and –cap monument). A TxDOT Type II monument shall be constructed on the Project ROW lines, perpendicularly left and right of each significant centerline point, regardless of the relative orientation of the final Project ROW line.

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

u) Documents shall contain deed references (survey name, abstract number, volume and page or document number, grantee, and area) for all existing public right of way encountered within the Project limits. If there is no recorded information found, a note shall state "Based upon our research, there appears to be no recorded vesting deed for the public right of way as shown hereon".

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

w) Developer shall cause the surveyor to include the denial of access line on the Project ROW map sheets and on the parcel plats, as required for controlled access facilities. Developer also shall cause the surveyor to describe the area of denied access in the parcel description and monument on the ground with a 5/8" iron rod with a TxDOT aluminum cap stamped "TxDOT ADL" the limits of the denied access.

x) The Project ROW map shall incorporate those parcels acquired in advance of a formal release for acquisition, including but not limited to parcels labeled as "AAQ", that are identified as required right of way on the approved roadway design schematic.

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

z) Within the proposed Project ROW, all property owned by a city, county, or other local public agency (LPA) in fee or easement that does not have a vesting deed shall be identified by a parcel number and included on the Project ROW map. Developer shall cause the surveyor to prepare a parcel description and parcel plat for use as an exhibit in the Project ROW acquisition (property transfer) documents.

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

bb) Parcel numbering shall follow the TxDOT *ROW Manual*. Parcels are to be numbered based upon the parent tract. Developer shall revise parcel numbering due to subsequent transactions as in the following example: From a 50-acre parent tract, with a proposed Project ROW acquisition parcel

identified as Parcel 14, a 5-acre tract is sold which will also require Project ROW acquisition. The result is, Parcel 14 is "Not Used", and the two new Project ROW acquisition parcels are identified as Parcel 14A and 14B. If the property containing Parcel 14B sells a portion, then 14B is "Not Used" and the new Project ROW acquisition parcels are identified as Parcel 14C and 14D, etc. Developer shall not use the letter "E" to avoid confusion with easement designations. Parcel numbering shall be sensitive to the appraisal of the required parcels.

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

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

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

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

gg) Developer at the request of the property owner or TxDOT shall re-stake the proposed ROW with a flagged wooden stake.

Design Certification. Developer shall provide sufficiency of design to determine the ROW need and produce ROW maps that delineate the proposed ROW and potential impacts to the remaining ROW. A design certification of ROW will be provided by Developer for each parcel which confirms that the proposed ROW acquisition is adequate and necessary to construct and perform operations and maintenance on the Project and that other ROW acquisition alternatives are not feasible and/or cost prohibitive.

7.3.2 Additional Reporting Requirements

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

a) Monthly Parcel Report: Developer shall provide a report, prior to the first of the month, listing all parcel deletions, parcel additions, and parcel splits.

b) Monthly Progress Report: Developer shall provide a report of all survey activity that occurred during the previous month, including a two-week look ahead of anticipated survey activity.

c) CAD Files: Developer shall provide digital CAD files in MicroStation format which includes: property lines and/or existing ROW lines, as surveyed; proposed ROW lines; parcel numbers; resource files; level assignments; and plot files. Developer shall submit CAD files prior to submitting the first Acquisition Package, and provide updates as needed.

d) Type II Monument Status Report: Developer shall provide a Type II Monument status report, and periodic updates as requested by TxDOT. The report shall include the state plane grid coordinates and station and offset from the appropriate baseline, if applicable, for each constructed monument.

7.3.3 Title Services

With respect to title services, Developer shall comply with the applicable standards identified in Section 7.2.1, including the following requirements:

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

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

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

d) Secure an owner's policy of title insurance in the amount of the total acquisition cost, to include cost of the property, improvements and damages to the remainder of the property, for each parcel from a title company acceptable to TxDOT for each parcel acquired, whether by deed or eminent domain judgment, insuring title as required by TxDOT. All Project ROW shall be acquired, and TxDOT's title in the Project ROW shall be insured, in fee simple absolute or easement interest as appropriate, free and clear of any and all liens and encumbrances. Title policies must be in a form and substance approved by TxDOT. Title to the Project ROW shall be insured in the name of the "State of Texas by and through the Texas Transportation Commission."

7.3.4 Introduction to Property Owners

TxDOT shall prepare and send out initial contact letters of introduction for both property owners and displacees, with the assistance and at the cost of Developer. The letters shall clearly describe the Project, TxDOT's need for the owner's property, and shall include the name and telephone number of a

Developer's representative. TxDOT's ROW Administrator or his/her designee will sign the letters on TxDOT letterhead. The forms for these letters will be approved by TxDOT prior to use. Property owners or displacees unable to read or understand the notice must be given appropriate translation.

Developer shall send a copy of the State of Texas Landowner's Bill of Rights for each property owner and submit a copy to be included with the letter of introduction. The copy of the Bill of Rights shall be the latest version as shown on the Office of the Attorney General website, https://www.oag.state.tx.us/agency/Landowners_billofrights.pdf.

7.3.5 Appraisals

7.3.5.1 Appraisal Services

Developer shall provide TxDOT with fair market value appraisals prepared by appraisers meeting the minimum qualifications established herein. Developer shall ensure that all appraisals are prepared in conformance with applicable Law (including the Uniform Act), and in accordance with professional appraisal methods and applicable TxDOT standards for all parcels to be acquired by TxDOT. Developer shall:

a) Select appraisers from TxDOT's list of precertified fee appraisers and meeting the requirements specified in Section 7.2.7 (ROW Personnel Qualifications). TxDOT shall have final Approval of the selection of each appraiser and appraisal reviewers submitted by Developer. Developer must identify and receive written Approval of the appraiser who will be responsible for the appraisal work product and who will be signing the reports.

b) Establish personal pre-appraisal contact with each owner of record title and each occupant, and document all contacts utilizing forms provided by TxDOT.

c) If necessary, make a diligent effort to secure a written agreement between the record title owner and Developer granting TxDOT, Developer or assignees permission to enter the applicable parcel to be acquired (a "Right of Entry Agreement"). Developer may at its sole discretion and expense offer to pay reasonable compensation for any required Right of Entry Agreements. If Developer, after best efforts, is unable to secure a Right of Entry Agreement from the property owner, Developer shall provide documentation acceptable to TxDOT indicating conversations, correspondence, and efforts used to attempt to secure the Right of Entry Agreement.

d) Contact the record title owners or their designated representatives, in writing, to offer them the opportunity to accompany the appraiser on the appraiser's inspection of the parcel, and maintain a record of all such contacts and attempts to contact in the parcel file.

e) Cause the appraiser to prepare a complete appraisal report for each parcel to be acquired to include the whole property, the portion to be acquired, and any damage to the remainder. It shall also include all improvements on the whole property, unless otherwise directed by TxDOT. The appraisal reports shall comply with and include all matters required by this section and TxDOT ROW related manuals, and shall satisfy the requirements of the USPAP in effect at the time the appraisal is submitted. Special analyses, studies or reports, as necessary, shall be made a part of each appraisal. The appraiser must use the most current edition of the standards referenced above and continually monitor these standards to ensure the appraisals conform to the most current requirements of professional appraisal practice. All appraisals shall utilize TxDOT Form ROW-A-5 - Real Estate Appraisal Report unless otherwise authorized by the TxDOT *Right of Way Manual* or TxDOT *Appraisal and Review Manual*; however, all appraisals for condemnation proceedings shall utilize TxDOT Form ROW-A-5 - Real Estate Appraisal Report.

f) Obtain and provide TxDOT with copies of all written leases, licenses and other occupancy agreements, including outdoor advertising/sign agreements that are not already included in the

Title Commitment, in order to identify lessees, licensee and other occupants with potential compensable interests in each parcel and to determine the value of each such interest.

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

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

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

j) Cause a report to be prepared by an environmental professional that meets the qualifications set forth in ASTM E-1527-05, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process, or provide a report in a manner approved by TxDOT, documenting the environmental condition of each parcel, which may be based on field investigations and/or historical review, as appropriate for the particular parcel. The report shall be completed in coordination with the appraiser(s) and shall be available to the appraiser(s). A Phase I environmental site assessment or a report provided in a manner approved by TxDOT shall be performed for all properties and submitted with the Acquisition Package. If it is determined that there is a potential environmental risk based on the Phase I report or other reports then a Phase II investigation shall be performed and submitted to TxDOT before a payment request is submitted for the purchase of the parcel or a Condemnation Package is submitted for Approval. A Phase III investigation shall be performed if the Phase II report justifies it. The Phase III report must indicate the approximate cost to remediate the parcel to achieve its current use and its highest and best use. Developer shall prepare timely written notification to TxDOT of any environmental or other concerns associated with the Project ROW or Additional Properties to be acquired that could require environmental remediation or other special attention or which would cause a report to be prepared. In the event that Developer has exhausted all means possible and is unable to access the properties to perform an ESA Phase II and/or III, Developer may submit the Acquisition Package and Condemnation Package without the ESA reports. However, Developer will be responsible for performing and receiving Approval from TxDOT for all required ESAs after possession of the property has been obtained through condemnation before commencement of construction.

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

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

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

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

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

7.3.5.2 Appraisal Review

In connection with appraisal review, Developer shall:

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

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

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

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

e) Upon completion of the review outlined above, the appraiser shall certify in writing to TxDOT that all required standards have been met. This certification will occur by signing on Page 1 of each TxDOT Form ROW-A-5 (Real Estate Appraisal Report) or TxDOT Form ROW-A-6 (Real Estate Appraisal Report) in the block provided. The review appraiser will also complete TxDOT Form ROW-A-10 (Tabulation of Values) to accompany each appraisal.

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

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

7.3.6 Project ROW Acquisition Package Approval

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

a) A cover sheet setting forth the following information for each parcel.

- Parcel number and number of parts
- Station number
- CSJ number
- Federal Identification Number (if applicable)
- Location of parcel
- Name of owner
- County and/or other jurisdiction
- Extent of acquisition (partial or whole acquisition)
- Type of conveyance (fee, easement, etc.)

b) A complete legal description of the parcel adequate to effect the desired acquisition of the parcel, signed and sealed by an RPLS. A legal description and parcel plat is required for each parcel. Control of access shall be addressed in all legal descriptions. All descriptions shall be in recordable form and shall be prepared in a form and manner acceptable to TxDOT in all respects.

c) The parcel plat, as prepared by the RPLS, and a half size (11" x 17") copy of the ROW map sheet(s) pertaining to the parcel, such plat to include control of access designations.

d) A title report, current within 90 Days, including copies of all documents identified in the exceptions listed therein and a plot of all easements identified therein. The Acquisition Package shall include Developer's analysis of each preliminary title report or title commitment to determine potential problems and proposed methods to cure title deficiencies. Developer shall perform title curative work. Developer shall provide TxDOT with copies of all curative documents.

e) A copy of the appraisal report with an effective date less than 180 Days and all supporting documentation.

f) A copy of the environmental site assessment and all amendments as described in Section 7.3.5.1j (Appraisal Services).

g) A real/personal property report detailing the items making up each parcel are classified as real estate, tenant-owned improvements or personal property. Particular attention shall be paid to items that have questionable classifications. A completed TxDOT Form ROW-A-9 (Property Classification Agreement).

h) Replacement Housing Calculations, notification of business eligibility, completed displacee interviews, all comparables used in estimating the Replacement Housing Calculations, and letter to displacee(s) explaining Replacement Housing Calculations. Calculations and replacement housing benefit package shall be prepared and reviewed by a qualified consultant, in conformance with TxDOT's standard relocation procedures and applicable to State and federal Laws.

i) The proposed initial offer letter, memorandum of agreement, deed, and any other documents, which shall be prepared by Developer as required or requested by TxDOT, on Developer's letterhead or as otherwise directed. TxDOT will provide the format for preparing these documents. Documents referred to in this section are standardized by TxDOT and modification of standardized documents shall be kept to a minimum. All changes are subject to Approval by TxDOT in writing, in TxDOT's sole discretion.

j) Any other required TxDOT forms, such as record of all contacts with the property owner or any party with a compensable interest.

No Acquisition Packages will be approved if performed or submitted by appraisers or agents not previously approved by TxDOT for this Project.

Upon TxDOT's prior written Approval of the Acquisition Package, Developer may proceed with the offer to the property owner.

7.4 Acquisition Activities

7.4.1 ROW Negotiations

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

a) Within ten Business Days of TxDOT's Approval of the Acquisition Package, contact each property owner or owner's designated representative, in person where practical, to present the offer and deliver an appraisal report (not more than 6 months old) and appropriate brochures. The approved appraisal shall be sent by certified mail, return receipt requested. A copy of the appraisal report for the subject property shall be provided to the property owner or authorized representative at the time of initial offer. All appraisal reports produced or acquired by TxDOT relating specifically to the property owner's property and prepared in the ten (10) years preceding the date of the offer must also be delivered to the property owner. Developer shall also maintain a file record of receipt of appraisal signed by the property owner. Developer shall also maintain follow-up contacts and secure the necessary documentation and title curative Work upon acceptance of the purchase offer.

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

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

d) Advise the property owners, lessees, licensees, occupants, and other holders of compensable interests, as applicable, of the administrative settlement process. Confer with and transmit to TxDOT's ROW Administrator any settlement request from property owners, lessees, licensees, occupants, or other holders of any compensable interest, as applicable, including a detailed recommendation from Developer in accordance with standards, manuals and procedures as defined in Section 7.2. TxDOT shall determine whether to accept a settlement request. Delivery of the administrative settlement request and Developer's recommendation to TxDOT must occur within 15 Business Days following Developer's receipt of the administrative settlement request.

e) Developer, at its request or the request by TxDOT and/or the TxDOT Administrative Settlement Committee, may participate in the evaluation of the administrative settlement request and attend the committee meeting.

f) Developer shall provide a letter with the TxDOT Administrative Settlement Committee's response to the property owner, lessee, licensee, occupant, or other holder of a compensable interest, as applicable. Developer shall deliver all settlement responses (if within reasonable proximity of the Project) by hand within three (3) Business Days after receipt. If this delivery method is not feasible, Developer shall mail (return receipt requested) response letters not more than three (3) Business Days following any decision by the TxDOT Administrative Settlement Committee. If Developer selects the mailing option, Developer shall make a telephone call to the property owner to discuss the settlement offer prior to mailing the response letter. The TxDOT ROW Administrator, on an as-needed basis, will convene the TxDOT Administrative Settlement Committee.

g) Notwithstanding an unsuccessful completion of the formal administrative settlement process, Developer may engage in ongoing negotiations with the owners of compensable interests. Developer shall develop and incorporate in its ROW Acquisition Plan a procedure for these negotiated settlements. Said negotiations may continue until such time as the Texas Transportation Commission adopts a minute order authorizing the filing of a condemnation petition. Developer shall submit to TxDOT its recommendation of a negotiated settlement and obtain TxDOT's consent prior to acceptance of any settlement.

h) Provide timely (i.e., not more than ten (10) Business Days after inquiry) response to the verbal or written inquiries of any property owner, lessee, licensee, occupant or other holder of a compensable interest, as applicable.

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

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

k) Prepare and deliver documents of conveyance (including bisection clause and access clause, if applicable) to the property owner, lessee, licensee, occupant, or other holder of any compensable

interest, as applicable, and obtain their execution of the same. All signatures on documents to be recorded shall be notarized in accordance with Texas Law.

l) Pursue and obtain Possession and Use Agreements (PUA) concurrently with the parcel negotiations. The form of PUA will be provided by TxDOT and will contain provisions allowing for construction to commence while negotiations are finalized. Such agreements will be sought and negotiated by Developer strictly in accordance with the Law and only with the prior written consent of TxDOT. If Developer exercises the use of a TxDOT PUA, Developer must obtain a deed or commence action on condemnation proceedings by forwarding a condemnation packet to TxDOT for Approval within six (6) months from the date of the PUA.

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

n) Developer shall prepare and deliver a final offer letter to the property owners, lessees, licensees, occupants, or other holders of any compensable interest, as applicable. The letter shall be on Developer's letterhead and shall be signed by the ROW Acquisition Manager. The final offer letter shall allow a property owner lessee, licensee, occupant or other holder of compensable interest at least fourteen (14) Days as the consideration time period to review the final offer. Developer shall submit to TxDOT, a copy of the final offer letter within two (2) days after delivery to the property owner.

If the final offer letter is not accepted, Developer shall follow the procedures established for condemnation.

7.4.2 Relocation Assistance

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

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

a) Monday thru Friday: 8:00 am to 5:00 pm

b) Saturday: 9:00 am to 12:00pm

c) Sunday: office may be closed

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

Developer's major activities with respect to the relocation assistance of occupants from Project ROW include:

a) Prepare a Relocation Plan in accordance with the TxDOT *Right of Way Manual*, Volume 3, Chapter 8 (Relocation Program Planning and Construction) within 90 Business Days after receipt of NTP1

b) Monitor relocation assistance activities.

c) Prevent fraud, waste and mismanagement.

d) Assist with all requests and be responsible for carrying out decisions made by TxDOT, the review/appeal process and judicial reviews.

Developer shall provide relocation assistance strictly in accordance with the Law, and, in particular, the Uniform Act and TxDOT standards. With respect to relocation assistance, Developer shall:

a) Provide written notice to all property owners, lessees, licensees, occupants, other holders of compensable interests, and other potential displacees regarding relocation assistance and produce and provide them with a relocation assistance brochure that has been approved by TxDOT. Developer shall perform relocation interviews, complete and maintain interview forms and discuss general eligibility requirements, programs, and services with potential displacees. Developer shall maintain a written record of all verbal contacts.

b) Give written notice of the pending acquisition to any non-eligible occupants. Any questions as to the eligibility of a potential displacee shall be directed in writing to TxDOT's ROW Administrator.

c) Contact and provide relocation assistance to those parties affected by the Project ROW acquisition and complete forms for all displacees, as required.

d) Locate, evaluate and maintain files on comparable available housing, commercial, retail, and industrial sites.

e) Calculate replacement supplement benefits.

f) Compute and submit requests for relocation rental/housing supplement to TxDOT prior to submission to relocatees. All relocation supplements shall be subject to TxDOT's written Approval.

g) Perform a Decent, Safe and Sanitary (DSS) inspection for each replacement housing comparable, photograph the comparable and complete the DSS inspection form, TxDOT Form ROW-R116 (Replacement Housing Inspection).

h) Obtain at least two moving estimates from moving companies to effect relocation of personal property or consistent with the Uniform Act.

i) Prepare moving plan with appropriate photos, sketches and inventory of personal property to be moved.

j) Coordinate moves with displacees and moving companies in accordance with TxDOT standards and the Uniform Relocation Act.

k) Maintain relocation contact logs on a TxDOT Form ROW-R96-R (Relocation Advisory Assistance – Parcel Record).

l) Attend all closings on replacement properties, if requested by any party involved, and assure supplemental payments, if any, are properly distributed.

m) Process and compute increased interest payments on the mortgage of owner-occupied dwellings, as required.

n) Deliver to displacees a 90 Day notice of eligibility letter simultaneous with the delivery of the relocation benefits package. Deliver a 90 Day letter to displacees with the location of the comparable property used to compute the supplement.

o) Deliver a 30 Day notice to displacees and property owners upon Possession of Project ROW.

p) Notify TxDOT's ROW Administrator office immediately if a displacee has not moved after 30 Day notice expires. Special effort and consideration should be extended to the displacees in the move out process. If the displacees have not moved from the State owned ROW and eviction is necessary, the Developer must provide written request to TxDOT to begin eviction proceedings. The request must include written evidence of the due diligence efforts to vacate the displacees. Prepare a written recommendation to facilitate the displacee's move.

q) Be available for any appeals or hearings.

r) Prepare relocation payment claim submissions for all displacees and all relocation assistance benefits.

s) Verify DSS dwelling criteria on all replacement housing as selected by the displacees.

t) Secure dwellings and structures no later than ten Days after vacancy and protect the Project ROW following acquisition and relocation.

u) Maintain a complete file, separate from acquisition files, on each displacee and make available for inspection.

v) Be responsible for all relocation activities that may occur after deposit of the Special Commissioner's award in the courts, including instances when a parcel referred to the Office of the Attorney General for eminent domain also has a relocation issue. Relocation computations shall be adjusted based on the approved administrative settlement and court award.

w) Prepare all correspondence to the displacees or their representative(s) on Developer's designated relocation letterhead and have Developer's correspondence signed by the Project ROW relocation agent.

x) Deliver to each displacee the relocation assistance payments according to the TxDOT ROW Manual Vol. 3 Relocation Assistance (Chapter 4 Program Administration, Section 1 Procedures, Delivery of Payment).

y) Assist TxDOT and the Office of the Attorney General with eviction proceedings. Serve notice of eviction proceedings to the occupant(s) of the property who have not complied with move dates. Coordinate the eviction process with the local authorities and accompany the Sheriff's Department when the local authorities are carrying out eviction.

7.4.3 Closing Services

For purposes of closing services, Developer shall:

a) Submit a closing submittal to TxDOT for review a minimum of 24 hours prior to closing. Closing submittals shall include the following: a.) a reference to the disposition of any environmental matters; b) updated title commitment, no more than fifteen (15) Days prior, with notations indicating the disposition of all schedule "B" and "C" items; c) a copy of the executed warranty deed to be delivered; d) a proposed closing statement indicating disposition of all proceeds; e) a copy of any and all releases of liens; f) a copy of any miscellaneous documents and other curative matters required to be delivered at closing and g) a copy of the closing memorandum outlined in item 2 below.

b) Prepare the escrow agreement and closing documents, including a closing memorandum identifying all parties involved in the closing, and listing all documents to be executed and/or delivered in connection with the closing.

c) Attend closings; provide curative documents and exhibits as required and in conjunction with the applicable title company. Confirm that all conditions to closing are satisfied and notify TxDOT of all closing appointments.

d) Obtain an issued title policy based on the approved updated title commitment within 30 Days following closing and transmit the same to TxDOT.

e) Obtain and deliver to TxDOT one (1) certified copy of each instrument of conveyance immediately after closing, and provide the original title policy to TxDOT within five (5) Business Days after receipt. Cause to be delivered to TxDOT the original recorded deed within ten Days after the title company receives the recorded deed.

7.4.4 Condemnation Support

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

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

a) Notify TxDOT of any potential condemnation and document the reason(s) for condemnation including recommendations for property closure.

b) Conduct all applicable eminent domain-condemnation activities in accordance with the policies and procedures as described in the TxDOT *Right of Way Manual*, Volume 4: "Eminent Domain "; in the TxDOT *ROW Appraisal and Review Manual*, Chapter 7 "Eminent Domain-State Acquisition" or as revised; and in Chapter 21, Texas Property Code and Senate Bill 18.

c) After non-response or upon receipt of a copy of the rejected final offer from a property owner or other property right holder entitled to compensation, request an updated title report from the title company issuing the original title commitment.

d) Provide to TxDOT, within ten Days following non-response or rejected certified mailing, notification thereof together with a signed and sealed parcel description and parcel plat, and a bisection clause and access clause, if necessary, with the clauses attached to a property exhibit containing the parcel description and parcel plat.

e) Use the information from the title report to join all parties having a property interest on applicable the TxDOT form. Spouses of property holders with compensable rights must also be joined.

f) Upon completion of TxDOT Form ROW-E-49 (Request for Eminent Domain Proceedings), prepare a condemnation packet containing two copies each of the following documents: the completed TxDOT form, negotiation logs, the updated title report not more than 90 Days old, appraisal receipt acknowledgment, pre-appraisal contact sheet, signed and sealed field notes, parcel sketch, bisection clause and access clause exhibits (if necessary), initial offer letter and final offer letter reflecting latest appraisal, complete minute order request form (form to be provided by TxDOT), any correspondence sent by Developer or from the owner of the compensable interest or representatives, one copy of the appraisal report not more than 180 Days old from the effective date of the appraisal report and evidence of a bona fide offer to the property owner. Submit two (2) complete Condemnation Packages to TxDOT's ROW Administrator for review and Approval.

g) Send a copy of the complete petition to the title company and confirm with the title company that the appropriate parties were joined in the case and that no changes in title have occurred since the original litigation guaranty was issued.

h) File the petition for condemnation with the appropriate court clerk after a determination that a timely settlement is not feasible. In counties that require e-filing, the Office of the Attorney General will e-file as appropriate and provide a copy of the petition to TxDOT. Developer shall file the lis pendens with the appropriate county clerk. No later than three (3) Business Days from the date of filing, Developer shall send a copy of the petition and lis pendens, by certified mail, return receipt requested, to the owner, lessee, licensee, occupant or other holder of compensable interest.

i) Coordinate and provide legal and technical support to TxDOT, as required to facilitate filing the petition, assignment of a court, and setting of a hearing date.

j) Make available to TxDOT on behalf of the Attorney General's office an agent who will be expected to assist in making arrangements for conferences with witnesses prior to trial, filing the condemnation petition, informing all parties as to the filing date of the petition and the case number assigned to the suit, and perform any other duties which will assist in the successful prosecution of the suit, including his or her attendance in court and filing necessary documents to complete all eminent domain proceedings.

k) Depending on the market conditions or if over six months have elapsed since the date of the initial offer, contact the attorney handling the case for TxDOT and confer about the advisability of preparing an updated appraisal. If it is determined that an updated or new appraisal is necessary or desirable, obtain such appraisal using the same procedures as described in Section 7.3.5.1 (Appraisal Services) above. Developer must also undertake appraisal review as described in Section 7.3.5.2 (Appraisal Review).

l) Coordinate with TxDOT on behalf of the Attorney General as to land planners and/or other expert witnesses as required by the Attorney General. Developer, at its cost, shall provide the land planner or other expert at the request of TxDOT or the Attorney General. The land planner or other expert report, if required, shall be completed and forwarded to the appraiser before the updated appraisal is completed.

m) Appear or provide for the appearance of expert witness(es) or fact witness(es) when requested by TxDOT or the Attorney General's Office. The appearances may include pre-commissioner's hearing preparations, special commissioner's hearings, and subsequent proceedings including jury trials and related proceedings.

n) Submit the updated appraisal to TxDOT and the attorney handling the case for TxDOT for review and Approval, which review and Approval shall occur within ten Business Days of receiving the updated appraisal. TxDOT and Developer must approve any revised offer in writing prior to an offer letter being sent. If a revised offer is approved, prepare a final offer letter, make the revised offer to the property owner or other holder of a compensable interest, as applicable, and submit a copy of the final offer letter to TxDOT for written Approval.

o) Communicate with TxDOT as to the parcel status on a monthly basis and in the Project progress report or as requested by TxDOT.

p) Serve in person, a "Notice of Hearing" not later than 20 Days before the date of the special commissioners' hearing or other hearings and notice requirements as directed or authorized by the court.

q) Call and send reminders letter two (2) to three (3) weeks in advance of any hearing to the assigned attorney, engineer, technical experts, appraiser, the commissioners, court reporter, and TxDOT's ROW Administrator concerning hearing dates.

r) Upon completion of the hearing, prepare TxDOT Form ROW-E-73 (Data Sheet – Special Commissioner's Hearing) and commissioners' time sheets. Developer shall make payment to all commissioners involved in the hearing and include payment for commissioners as part of general Project ROW services.

s) Coordinate and provide support to TxDOT's counsel and facilitate distribution of copies of award, prepare request for payment, and file notice of deposit. Developer shall coordinate with TxDOT on behalf of the Office of the Attorney General regarding expert witnesses needed to testify on behalf of the State at the special commissioners' hearing and subsequent proceedings including jury trials. At the request of the Office of the Attorney General or TxDOT, Developer shall provide and pay for all necessary expert witnesses including: engineering, land planners, real estate consultants, cost estimators, outdoor advertising sign experts and environmental consultants and Developer shall appear as expert witness or fact witness, as requested. Developer shall also make any Subcontractors available to appear as an expert witness or fact witness, as requested at the special commissioners' hearing or subsequent proceedings up to Final Acceptance of the construction project or through any maintenance agreement periods. The selection of all expert witnesses to be used for jury trials shall be determined by the Attorney General's Office.

t) Schedule and pay for all court reporter services, transcription costs, expert witness fees, exhibits, and exhibit workbooks as directed by TxDOT.

u) Be responsible for coordinating the pre-hearing meeting with TxDOT on behalf of the Attorney General's office and all others required for testimony or exhibit preparation. Developer shall require expert witnesses with all exhibits and documents to be present at a pre-hearing meeting.

v) Timely file and provide proper service of objections if requested by TxDOT after completion of the special commissioner's hearing and promptly provide evidence of filing and copies of all filed documents to TxDOT. Within three (3) days after objections have been filed, Developer, at its cost, shall order transcripts of such hearing.

w) Developer shall provide an individual or individuals having sufficient knowledge of the design of the Project to appear as an expert witness for testimony at the Special Commissioner's Hearing or other proceedings. This individual(s) is also responsible for preparing exhibits as requested by TxDOT or the Office of the Attorney General in support of said testimony. Exhibits shall be left in the custody of TxDOT at the close of the hearing.

7.4.5 Clearance/Demolition of Project ROW

Prior to demolition of any improvements, Developer shall provide to TxDOT, photographs of the property and all improvements, unless the special commissioner's hearing has been completed and objections have not been filed. Developer shall also have photos of personal property and any other items of dispute in and of a quality suitable for presentation as evidence in court. See Attachment 7-1 that shows known Port of Corpus Christi buildings/improvements requiring demolition. Following acquisition or possession of any parcel of Project ROW, Developer shall:

a) Within ten (10) Days from vacancy of the property and improvements, secure and protect the buildings, improvements and fixtures on the Project ROW until they are disposed of or demolished. Developer shall board-up, mow, fumigate and winterize as required by TxDOT or applicable Law.

b) Coordinate with the owner and occupants to assure the clearance of personal property from the Project ROW, as applicable.

c) Provide for any insect and rodent control and initiate extermination as required to protect the adjacent properties and rid the Project ROW from infestations.

d) Secure Governmental Approvals required for demolition and environmental surveys or tests, and notify TxDOT in writing of all such activities.

e) To the extent required by Section 7.2.11 (Developer Responsibility for Costs), prepare necessary documentation for disposal of improvements, fixtures and buildings in accordance with applicable Laws and submit the same to TxDOT.

f) Provide written notification to TxDOT of any real and/or personal property remaining on the Project ROW after vacated by the occupants and not acquired as part of the acquisition.

g) Terminate all utility service(s) when appropriate.

h) Process all required forms, documents and permit applications in order to proceed with the timely demolition or removal of any and all improvements, buildings and fixtures located within the Project ROW, as applicable.

i) Demolish and/or remove all improvements.

j) Notify TxDOT upon completion of the demolition and clearance of the Project ROW, as applicable.

7.4.6 Payment Schedule

Developer must submit a payment submittal for any item that is a TxDOT payment responsibility as outlined in Section 7. A payment submittal shall consist of:

a) Completed Payment Request forms for each type of payment

b) All required appropriate documents as shown on each Payment Request form.

c) Form AP-152 (Tax Payer Identification Number).

The State's warrant will be returned to Developer's ROW Acquisition Manager.

7.4.7 Property Fence

In connection with fences, Developer shall comply with the policies and procedures of the TxDOT *Right of Way Manual*, as well as the specifications found in the current TxDOT *Standard Specifications for Construction of Highways, Streets and Bridges (2004)*. Fencing standards for Developer-provided fencing shall conform to the overall aesthetics requirements found elsewhere in these Contract Documents and referenced standards.

7.4.8 ***Property Fencing for Public Properties***

Where public facilities now exist that are in high risk areas for public use (particularly those containing parks, sport areas, schools or any highly traveled pedestrian areas), Developer shall construct similar like fence as in the preexisting condition or, at a minimum, construct a 6-foot-high chain-link fence with metal posts if no fence was in the preexisting condition. Developer shall use Good Industry Practice in fencing public properties to control public access to the Project.

7.4.9 Property Fencing for Private Properties

Developer shall instruct the appraiser to use the "Cost to Cure" format to compensate an owner of private property for a replacement fence when the Project ROW line leaves one or more unfenced remainder property(ies) that were fenced before the taking. Compensation for the new fencing will be based upon the same type of fence as the property owner's existing fence.

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

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

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

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

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

7.5 Early ROW Acquisition

TxDOT shall notify Developer if certain Project ROW parcels are scheduled to be acquired by TxDOT or Governmental Entities prior to issuance of the NTP2. Developer will be updated regularly on the status of the acquisition process for each parcel, if any.

After NTP2, Developer shall complete the acquisition process and coordinate the scheduling of any remaining early Project ROW acquisitions.

Notwithstanding the foregoing, TxDOT will remain responsible after NTP2 for the acquisition of properties to be donated by the City of Corpus Christi and the Port of Corpus Christi, as shown on the advanced ROW acquisition exhibits.

8 GEOTECHNICAL

8.1 General Requirements

Developer shall perform all geotechnical investigations, testing, research, and analysis necessary to effectively determine and understand the existing surface and subsurface geotechnical conditions of the Project to be used by Developer to carry out the Work. Developer shall ensure the geotechnical investigations and analyses are both thorough and complete in accordance with TxDOT's *Geotechnical Manual*, TxDOT's *Pavement Design Guide*, AASHTO and FHWA geotechnical requirements, so as to provide accurate information for the design of roadways, pavements, foundations, structures, embankments, excavations, slopes and other facilities that result in a Project that is in accordance with TxDOT, AASHTO and FHWA geotechnical requirements, and meets the Agreement requirements.

8.2 Design Requirements

8.2.1 Subsurface Geotechnical Investigation by Developer

The subsurface investigation shall include but not be limited to soil borings, test pits, rock coring and pavement coring. Developer shall determine the specific locations, frequency, and scope of all subsurface geotechnical investigations, testing, research, and analysis Developer considers necessary to provide a safe and reliable roadway, pavement, foundation, structure, embankment, excavation, slope and other facilities for the Project in accordance with TxDOT, AASHTO and FHWA geotechnical requirements.

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

Developer shall prepare and amend, as needed, its Geotechnical Engineering Reports documenting the assumptions, conditions, and results of the geotechnical investigations and analyses, including the following:

a) The geology of the Project area, including soil and/or rock types, and drainage characteristics.

b) Field investigations and laboratory test results used to characterize conditions. Field investigations shall include descriptions of the soil/rock, Texas Cone Penetration test results, Dynamic Cone Penetrometer (DCP) test results, Falling Weight Deflection (FWD) results, other in-situ test results, and recovery and RQD for rock cores. Results of laboratory testing shall include moisture content, plasticity index, gradations for each major soil strata change, levels of shrink/swell potential, levels of sulfate (on-site and borrow), soil compressibility, compaction characteristics (Proctor tests), resilient modulus tests, short-term and long-term strength tests and properties in accordance with TxDOT and ASTM geotechnical testing standards. Other field exploration and laboratory testing shall be performed as appropriate.

c) A discussion of conditions and results with reference to specific locations on the Project.

d) Design and construction parameters resulting from the geotechnical investigation and analysis, including parameters for the design of pavements, pipes, foundations, structures, slopes, retaining walls, sound walls and embankments in accordance with TxDOT, AASHTO and FHWA geotechnical requirements.

e) Slope stability analyses for embankment and excavation, including roadway section, and retaining wall slopes including both short-term (undrained) and long-term (drained) conditions, and discussion of design measures undertaken to ensure stability and safety of all slopes. The design minimum factor of safety required for global stability of all slopes and walls shall be in accordance with the TxDOT *Geotechnical Manual*. The analysis shall consider the potential for

long-term surficial slide failures common to high plasticity clays in Texas, and specific recommendations shall be provided to minimize their occurrence.

f) Plan view locations of field sampling (Boring Locations Plan), boring logs and other field data, laboratory test results, calculations, and analyses that support design decisions.

The report shall:

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

b) Provide design and construction parameters derived from geotechnical investigations for the design of structure foundations, pipes, pavements, slopes, embankments, detention ponds and earth retaining structures.

c) Assess the corrosion potential of the soil and rock materials and conditions that will be encountered, and the impacts to planned surface and subsurface facilities.

d) Assess the organic and sulfate contents of sampled soils and implications, especially if considering chemical modification/stabilization.

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

Pavement Design

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

Corridor traffic data is provided in the Reference Information Documents (RID) and shall be deemed a minimum acceptable traffic volume and composition to be used by Developer for the purpose of pavement design reports. TxDOT does not warrant the accuracy or completeness of the corridor traffic data, extrapolations, or interpretations of current or future traffic or composition of traffic. Developer shall not be entitled to rely on the corridor traffic data for the purpose of determining: (a) the nature timing of pavement Renewal Work, (b) the number of cycles of pavement Renewal Work, or (c) the extent of any other O&M Work needed to meet the Performance Requirements and the Handback Requirements and all such determinations shall be a Developer risk regardless of whether the actual traffic volume and composition exceeds that identified in the RID.

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

Table 8-1: Lane Distribution Factors

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

Developer should expect that subgrade materials will vary throughout the Project limits. Developer shall verify that the materials encountered or imported meet the Effective Modulus of Subgrade Reaction, effective resilient modulus, or other design subgrade support value as utilized for the structural section design. If the site subgrade materials have on average a differing value than those used for the Proposal-phase pavement designs, Developer shall submit an adjusted pavement design for review and acceptance by TxDOT.

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

a) US 181, I-37, SH 286 Mainlane pavements

b) US 181, I-37, SH 286 Frontage Road pavements

c) Ramp pavements

d) Collectors, Local Streets, Arterial Roads, FM Roads, Cross Street pavements

e) Service driveways and parking areas

f) Temporary pavement; construction areas/detours

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

a) Pavement design details by location, including structural layer materials, general specifications, and thicknesses

b) Life-cycle cost analysis as required by the TxDOT *Pavement Design Guide*, including the periods for resurfacing, reconstruction, and other rehabilitation measures and what these activities are likely to entail

c) Relevant pavement evaluation data (structural and functional) and condition information on adjacent roads

d) Site conditions which might influence the design and performance of pavements

e) Relevant geotechnical data and drainage requirements including boring logs, laboratory soil test results, and active or passive drainage system design for all pavement including temporary detours.

f) Design criteria used in determining the pavement design(s), including traffic loads, pavement material characterization, environmental conditions, reliability level, and pavement performance periods and design life

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

Developer shall submit the following to TxDOT for review:

a) Pavement design reports and any subsequent supplements or amendments. The reports shall include results of the field explorations and testing of pavement sections as well as recommended pavement rehabilitation methods and designs for new pavements.

b) Verification of Proposal phase pavement thickness designs

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

d) A list of all geotechnical and pavement design/evaluation software proposed for use

e) Verification plan for all structural layers

8.2.1.1 Related Pavement Materials Specifications

Unless otherwise specified herein, pavement material requirements are defined in the TxDOT *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2004* (hereafter referred to as the TxDOT *Standard Specifications 2004*) and per special provisions as provided in these Contract Documents. Test procedures identified herein shall be the most current version identified in the Materials Test Procedures, AASHTO or ASTM standards or equivalent guidance as approved or provided by TxDOT.

8.2.1.2 Pavement Type Selection

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

US 181, I-37, SH 286

Mainlane Pavement. In the case of rigid pavement selection, Developer shall use CRCP in accordance with Section 8.2.1.2.1. Flexible pavement selection shall be designed in accordance with Section 8.2.1.2.2.

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

Frontage Roads, Collectors, Local Streets, Arterial Roads, FM Roads, Cross Streets

Roadway Pavement. In the case of rigid pavement selection, Developer shall use CRCP in accordance with Section 8.2.1.2.1. Flexible pavement selection shall be designed in accordance with Section 8.2.1.2.2.

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

Ramps

Ramp Pavement. Ramp pavements shall be constructed with the same section (materials and depths) as the adjacent frontage road pavement, unless otherwise required in Section 8.2.1.2.

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

Facility Access Parking

When required, facility access parking areas shall be CRCP in accordance with TxDOT CRCP standards or CPCD in accordance with TxDOT CPCD standard. The CRCP shall have a minimum concrete thickness of eight (8) inches unless otherwise specified by TxDOT.

8.2.1.2.1 Rigid Pavement

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

Table 8-2: Rigid Pavement Design Inputs

28 day Concrete Modulus of Rupture, psi	620
28 day Concrete Elastic Modulus, psi	5,000,000
Effective Modulus of Sub base/Subgrade Reaction, psi/inch	300 max.
Serviceability Indices ▪ Initial Serviceability Index ▪ Terminal Serviceability Index	 4.5 2.5
Load Transfer Coefficient	*
Drainage Coefficient	**
Overall Standard Deviation	0.39
Reliability %	95
* Table 8-1, *TxDOT Pavement Design Guide, Revised January 2011* ** Table 8-2, *TxDOT Pavement Design Guide, Revised January 2011*	

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

TxDOT Corpus Christi District Subgrade Process. Developer shall use embankment material with a plasticity index (PI) ranging from 10 to 35. Blend or treat approved materials to achieve the desired PI and crush the material so that 100% passes the 3 inch sieve. Retest materials as borrow sources change or when the material changes significantly. Developer shall notify TxDOT of the proposed material sources and of changes to material sources.

Developer shall provide verification to TxDOT that PI, Gradation and Density will be achieved. Density shall meet the requirements of TxDOT Specification; Item 132 Embankment.

Cut materials shall meet above requirement to a depth of 1 foot; for embankment a minimum depth of 1 foot must be met.

8.2.1.2.2 Flexible Pavement

Design Methodology. For flexible pavement design, Developer shall use the TxDOT online *Pavement Design Guide*. The pavement designs shall utilize either the TxDOT FPS 21 procedure or the 1993 *AASHTO Guide for the Design of Pavement Structures* and the DARWin 3.1 or comparable computer program. Developer shall check all pavement thickness designs using the Modified Texas Triaxial Class design method, and other analyses methods necessary to prevent premature failure from rutting and fatigue.

Performance Period Requirements. The design life for the Project will be based on the following:

US 181, I-37, SH 286

Mainlane Pavement. A design life of thirty (30) years shall be used with an initial performance period of at least fifteen (15) years.
Shoulders. Pavement for the shoulders shall have the same design life and initial performance period as the adjacent mainlane pavement.

Frontage Roads, Ramps, Collectors, Local Streets, Arterial Roads, FM Roads, Cross Streets

Roadway Pavement. A design life of thirty (30) years shall be used with an initial performance period of twelve (12) years when projected traffic loads are less than 1 million ESALs and fifteen (15) years for more than 1 million ESALs.
Shoulders. Pavement for the shoulders shall have the same design life and initial performance period as the adjacent roadway pavement.

TxDOT Corpus Christi District Subgrade Process. Developer shall use embankment material with a plasticity index (PI) ranging from 10 to 35. Blend or treat approved materials to achieve the desired PI

and crush the material so that 100% passes the 3 inch sieve. Retest materials as borrow sources change or when the material changes significantly. Developer shall notify TxDOT of the proposed material sources and of changes to material sources.

Developer shall provide verification to TxDOT that PI, Gradation and Density will be achieved. Density shall meet the requirements of TxDOT Spec Item 132.

Cut materials shall meet above requirement to a depth of 1 foot; for embankment a minimum depth of 1 foot must be met.

Design Modulus. Developer shall establish the design modulus using laboratory resilient modulus tests conducted on representative samples of the soils supporting the pavement structures when using the 1993 *AASHTO Guide for the Design of Pavement Structures methodology*. This design modulus shall not exceed the Effective Resilient Modulus as described below. Pavement designs using the FPS 21 design procedure will use the back-calculated subgrade modulus acquired from pavement locations in the proximity of the proposed sections. Design moduli determined from methods identified are applicable to the pavement design method used, where the material is placed in the pavement structure, and in accordance with layer thicknesses specified in Table 8-4. When it is in the interest of TxDOT to use alternative methods for determining material moduli proposed by Developer, justification and documentation shall be provided to demonstrate that an equivalent pavement structure will be provided.

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

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

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

   Distribute MR values as shown in Table 8-3 for the region in which Developer will be constructing the Project. Determine which distribution to apply by selecting the rainfall range appropriate for the Project location from the *TxDOT Pavement Design Guide*, Chapter 8, Section 4.

Table 8-3: Regional distribution of months used to determine Effective Resilient Modulus.

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

b) ***Unbound Base and Subbase.*** Only material meeting the definition of Unbound Base in Section 8.3.1 will be considered; all other unbound materials used as a pavement layer that do not meet this definition shall be considered subgrade/embankment. For materials meeting the requirements of Item 247, TxDOT *Standard Specifications (2004),* the design modulus shall not exceed three times the Effective Resilient Modulus when using the 1993 AASHTO design method or three times the back-calculated subgrade modulus when using the FPS 21 design method for the layer immediately below the unbound base or subbase layer, and shall not exceed 60,000 psi for either design method.

c) ***Stabilized Base***. Stabilized base materials shall meet the requirements of Stabilized Base in Section 8.3.1, or shall be considered a subgrade or subbase material that may require stabilization. The design moduli of stabilized base materials shall be five times the Effective Resilient Modulus for subgrade when using the 1993 AASHTO design method or five times the back-calculated subgrade modulus when using the FPS 21 design method. Refer to Table 8-4 for asphalt stabilized base moduli.

d) ***Stabilized Subbase and Stabilized Subgrade.*** Materials shall meet the requirements of subbases in Section 8.3.1 or the material shall be regarded as subgrade material and may be subject to MR or FWD measurements. Stabilized subgrade and stabilized subbases may be incorporated as a structural layer and shall have a design modulus equal to two (2) times the value of the Effective Resilient Modulus of the subgrade when using the 1993 AASHTO design method or two (2) times the back-calculated subgrade modulus when using the FPS 21 design method.

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

f)

Table 8-4: Design Structural Values

Material Type	Maximum Modulus for FPS 21	AASHTO layer coefficient (max.)
Dense-Graded Hot Mix Asphalt	Combined HMA thickness: ≤8” use 500ksi > 8.0” use 650ksi	 0.44 0.45
Permeable Friction Course	300 ksi	0.30
Performance Design Mixtures	Combined HMA thickness: ≤ 6.0” use 650ksi 6”<T≤8” use 700ksi > 8.0” use 850ksi	 0.45 0.46 0.47
Stone-Matrix Asphalt	Same as Performance Design Mixtures	Same as Performance Design Mixtures
Unbound Base	*60 ksi	0.14
Stabilized Base ▪ Cement ▪ Asphalt	 *200 ksi 350 ksi	 0.16 0.34
Stabilized Subgrade or Sub-base ▪ Hydrated Lime ▪ Cement	 *35 ksi *40 ksi	 0.12 0.12

* Maximum design values.

Poisson’s Ratio. Use 0.20 for cement stabilized or fly ash stabilized materials meeting the requirements of Items 275, 276 and 265 as defined in the TxDOT *Standard Specifications (2004)*. Use 0.35 for all other materials not identified in the aforementioned items; except for subgrade or embankment/fill materials, use 0.4.

Truck Volumes. Developer shall determine the percentage of truck traffic as well as the annual growth percentage in truck volumes for pavement design.

Initial ADT and 20-year projected ADT. .Developer shall determine the Initial ADT and the projected ADT.

Initial Serviceability Index. The initial serviceability index for mainlane pavements on this Project shall be 4.5.

Terminal (Minimum Acceptable) Serviceability Index. The terminal serviceability index at the end of any performance period for this Project shall be 3.0 (mainline and arterials). A serviceability index of 2.5 may be used if the HMA thickness exceeds eight inches.

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

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

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

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

8.3 Construction Requirements

8.3.1 Pavement Materials Requirements

Developer shall incorporate the following requirements into the preparation of the pavement designs, plans, quality control and quality assurance programs, and the field construction procedures. Subject to Approval by the TxDOT, alternate material specifications and construction requirements may be proposed by Developer provided the objectives of the Project are met and an equivalent pavement structure is provided.

Subgrade/Embankment Material Composition. Developer shall analyze subgrade and imported embankment material composition, design the pavement structure, and perform necessary construction procedures to eliminate soluble sulfate induced heave. When soluble sulfates may present a potential for a reaction detrimental to the pavement structure, Developer shall submit alternate designs and/or construction procedures for TxDOT Approval.

When quantities of soluble sulfates detected are greater than 500 ppm using Tex-145-E, Developer shall determine the source of the sulfate and whether there are greater concentrations existing or that would be created when pulverized in and surrounding the sampled location. Use the *TxDOT Guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures* to assist with testing and detection and construction practices. Similarly, subgrade materials will be evaluated for organic content in accordance with the TxDOT Pavement Design Guide.

Developer shall meet embankment/subgrade requirements as explained in the above ***TxDOT Corpus Christi District Subgrade Process***; and shall meet the requirements of TxDOT Spec Items 110 and 132.

TxDOT Process.

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

Base material shall have a minimum PI of 4 and meet requirements of 247 TY A GR 1.

Stabilized Base. Stabilized base may either be modified with chemical additives or asphaltic binders. Materials to be stabilized shall meet the requirements of either Grade 1, Grade 2, or Grade 5 base as defined by Item 247 of the TxDOT *Standard Specifications (2004)* or appropriate special provisions, and shall have a minimum thickness of 6 inches. Asphalt stabilized base material will meet the requirements of Item 292 of the TxDOT *Standard Specifications (2004)*. When chemical additives are used to stabilize base, Table 8.5 will be used to determine the stabilizer content. Stabilized base will be designed to achieve the unconfined compressive strength shown in Table 8.5 immediately following a ten (10) day capillary moisture conditioning. Moisture conditioning will be conducted in a similar method as that used in TEX-121-E.

Base material shall have a minimum PI of 4 before stabilization.

Table 8-5: Minimum and maximum retained unconfined compressive strength values to be achieved when using chemical additives for stabilization, by pavement type.

Pavement Type	Minimum UCS (psi)	Maximum UCS (psi)
Flexible Pavement	300	500
Rigid Pavement	500	750

Subbases.

a) ***Granular Materials***. Materials classified by the Unified Soil Classification System as any of the following: GP, GM, SW, SP, SM, SC, ML, shall be stabilized if present within 30 inches of the finished pavement surface. The aforementioned materials may be used as a subbase and included as a structural layer when stabilized and meet the requirements of stabilized subbase as defined herein. These materials shall be stabilized, when required, to achieve a minimum layer thickness of 6 inches. Untreated granular base meeting the requirements of Item 247, Grade 1 or 2 may replace these materials without restriction.

b) ***Stabilized Subbase.*** Materials not included in *Granular Materials* above, do not meet the requirements of Item 247, TxDOT *Standard Specifications (2004)*, or materials that have a Plasticity Index (PI) value less than 25, may be stabilized and used as a structural layer. For structural layers, provide a minimum 6-inch thickness of compacted material. Stabilized subbase materials shall be designed to achieve not less than 100 psi unconfined compressive strength immediately following a ten (10) day capillary moisture conditioning. Moisture conditioning will be conducted in a similar method as that used in TEX-121-E. These materials shall be designed as defined in test methods used for the selected additive.

c) ***Stabilized Subgrade.*** If subgrade stabilization is used for purposes of providing a working platform then no structural benefits can be claimed and the stabilized subgrade shall not be included in the pavement design. In the event that subgrade stabilization is used as a working platform then it must be called out in the Pavement Design Report. For structural layers, provide a minimum 6-inch thickness of compacted material. If a structural layer is required, design and mold subgrade material with the desired additive using the TxDOT test method appropriate for the additive incorporated. The design shall achieve not less than 100 psi unconfined compressive strength immediately following a ten (10) day capillary moisture conditioning conducted in a method similar to that used in TEX-121-E.

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

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

Mix Selection. Where flexible pavement structures are selected, the final surface course shall be SuperPave Ty D or SMA D.

Final surface. The final surface is to be constructed all at once.

8.3.2 Construction Verification

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

TxDOT Corpus Christi District Subgrade Process.

Developer shall provide a verification plan to TxDOT to ensure that PI, Depth, Density and Gradation will be achieved and are tested.

Effective Resilient Modulus, (MR). Developer shall provide subgrade modulus verification testing in accordance with AASHTO T307. Retrieve a randomly selected verification sample at a minimum rate of one sample (three replicates per sample) for each 2500 linear feet of roadbed; where the roadbed has a dimensioned width greater than 100 feet, one additional sample will be collected and tested. Frontage and other access roads are sampled and tested independently if more than 100 feet separates the roadbeds or are not parallel to the mainlane alignment. Additional samples shall also be taken at each location where a significant and recognizable change in subgrade material (a change in USCS classification) is encountered during grading operations.

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

Regardless of the position of the layer or material sampled and tested, use only the AASHTO T307 load sequence number 7 of 15 for verification testing (4 psi confining pressure, 4 psi maximum axial stress for Type 2 materials; 10 psi confining pressure, 10 psi maximum axial stress for Type 1 materials). The MR results from this testing shall be compared to the Effective MR selected for use in designing the pavement structure, to confirm that the material meets the design criteria. If the materials fail to meet the criteria, Developer shall be responsible to take corrective action that is acceptable to the TxDOT.

Alternate Procedures to Verification of Effective Resilient Modulus, (MR).

1.) Deflection-based verification, to be performed on top of stabilized subgrade and on top of flexible base layers. Deflection testing will be accomplished using an FWD with drops taken at 200-ft intervals along the alignment of both the left and right wheel paths of the finished structure, with 100-ft offsets between adjacent wheel paths. On stabilized soils, allow a 3-day curing/mellowing period prior to testing. Deflections will be normalized to a 9,000-lb drop load and will not exceed calculated deflections at these structural interfaces as determined by simulated FWD plate loading (layered elastic system) using the design elastic modulus values for the layers modeled at these interim construction stages. Further investigation using a DCP will be accomplished at each location (+/- 20-ft) that does not meet the deflection threshold to determine depth of problematic material for corrective action.
2.) Intelligent compaction-based verification, to be performed on top of the stabilized subgrade and flexible base layers. On stabilized soils, allow a 3-day curing/mellowing period prior to testing. A color-coded “proof-mapping” chart will be developed in accordance with the special specification developed by TxDOT. Red-mapped areas constituting locations not achieving at least 25% of the Intelligent Compaction Target Value (ICTV) will be further evaluated by FWD to determine compliance with limiting deflection thresholds by layer as described above, or DCP to determine depth of weak material for corrective action.

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

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

TxDOT will evaluate profiles based on the CQAF test results to determine acceptance and corrective action. Corrective action acceptable to TxDOT is required, at Developer’s sole expense, for any 0.1-mile section that measures an average IRI in excess of 75 inches per mile for rigid pavements, or in excess of 65 inches per mile for flexible pavements. After making corrections, re-profile the pavement section to verify that corrections have produced the required improvements.

Use diamond grinding or other methods approved by TxDOT to correct surface areas that have more than 1/8 inch variation between any two contacts on a 10-foot straightedge. Use diamond grinding or other approved methods to remove localized roughness as determined using an inertial profiler in accordance with TEX-1001-S. For asphalt concrete pavements, fog seal the aggregate exposed from diamond grinding.

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

9 LAND SURVEYING

9.1 General Requirements

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

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

Developer shall employ a survey manager to be responsible for all right of entry, control surveys, topographic surveys, construction staking, and all other surveying work necessary to complete the Project and produce accurate Record Drawings. Except for the initial survey control data furnished by TxDOT, all calculations, surveying and measuring required for setting and maintaining the necessary lines and grades shall be performed by the Developer.

9.2 Administrative Requirements

9.2.1 Standards

Developer shall ensure that all surveying conforms to the *TxDOT Survey Manual* and the *General Rules of Procedures and Practices* of the Texas Board of Professional Land Surveying. Developer shall ensure that any person in charge of a survey field party is proficient in the technical aspects of surveying.

9.2.2 Right-of-Entry

Developer shall secure written permission prior to entering any private property, unless previously provided by TxDOT. Developer is required to review and comply with all conditions stated within any TxDOT provided ROE document. It shall be the Developer's sole responsibility to negotiate this permission and Developer shall be responsible for any and all damages and claims resulting from that ingress. Proper documentation of right-of-entry shall be maintained at all times by Developer.

9.2.3 Survey by TxDOT

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

9.3 Design Requirements

9.3.1 Units

All survey Work shall conform to Texas State Plane Coordinate System in U.S. Survey Feet.. The surface adjustment factor for the Project is 1.00000 (Grid x 1.00000 = Surface Coordinates).

9.3.2 Survey Control Requirements

Developer shall base all additional horizontal and vertical control on the Level 2 and Level 3 control provided by TxDOT. Developer shall establish and maintain a permanent survey control network. The control network should consist of, Datum Points as defined in the TxDOT Survey Manual and at a spacing of no greater than 0.5 to 0.75 miles.

Developer shall establish any additional survey control, as needed, and values for the additional survey control shall be derived from the existing TxDOT-supplied Primary (Level 2) and Secondary (Level 3)

control network. All survey control and ROW monumentation shall be protected from disturbance throughout the duration of the project.

If Developer chooses to use GPS methods, Developer shall meet the accuracy of the appropriate level of survey as defined in the GPS Section of the TxDOT *Survey Manual* and shall utilize the primary survey control to be provided by TxDOT.

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

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

Developer shall deliver to TxDOT a listing of all primary and secondary control coordinate values, original computations, survey notes, and other records, including GPS observations and analysis made by Developer as the data are available.

9.3.3 Conventional Method (Horizontal & Vertical)

If Developer chooses to use conventional methods to establish additional horizontal control, Developer shall meet the accuracy of the appropriate level of survey as defined in the following tables.

9.3.3.1 Horizontal Accuracy Requirements for Conventional Surveys

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

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

* TxDOT policy requires all bearings or angles be based on the following source: Grid bearing of the Texas Coordinate System of 1983, with the proper zone and epoch specified.

9.3.3.2 Vertical Accuracy Requirements for Conventional Surveys

Vertical control shall be established (at a minimum) on the North American Vertical Datum of 1988 (NAVD 1988).

	1st ORDER	REMARKS AND FORMULAE
Error of Closure	0.013 feet $\sqrt{K}$	Loop or between control monuments
Maximum Length of Sight	250 feet	With good atmospheric conditions
Difference in Foresight and Backsight Distances	±10 feet	Per instrument set up
Total Difference in Foresight and Backsight Distances	±20 feet. per second	Per total section or loop
Recommended Length of Section or Loop	2.0 miles	Maximum distance before closing or in loop
Maximum Recommended Distance Between Benchmarks	2000 feet	Permanent or temporary benchmarks set or observed along the route
Level Rod Reading	± 0.001 foot	
Recommended Instruments and Leveling Rods	Automatic or tilting w/ parallel plate micrometer precise rods	When two or more level rods are used, they should be identically matched
Principal Uses	Broad area control, subsidence or motion studies jig & tool settings	

9.3.4 Right of Way Surveys

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

9.3.4.1 Accuracy Standard

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

CHART OF TOLERANCES

	URBAN / RURAL	URBAN BUSINESS DISTRICT	REMARKS AND FORMULAE
Error of Closure	1:10,000	1:15,000	Loop or between Control Monuments
Angular Closure	15" $\sqrt{N}$	10" $\sqrt{N}$	N = Number of Angles in Traverse
Accuracy of Bearing in Relation to Source *	20 "	15 "	Sin α = denominator in error of closure divided into 1 (approx.)
Linear Distance Accuracy	0.1 foot per 1,000 feet	0.05 foot per 1,000 feet	Sin α x 1000 (approx.) where ± = Accuracy of Bearing
Positional Error of any Monument	*AC*/10,000	*AC*/15,000	*AC* = length of any course in traverse
Adjusted Mathematical Closure of Survey (No Less Than)	1:50,000	1:50,000	

* TxDOT policy requires all bearings or angles be based on the following source: Grid bearing of the Texas State Plane Coordinate System of 1983, with the proper zone and epoch specified.

9.3.5 Survey Records and Reports

Developer shall produce a horizontal and vertical control report including coordinate listing, maps showing control, preparation of standard TxDOT data sheets for all primary control, monument description and location description of all primary and secondary survey control points installed, marked and referenced along with a listing of the existing control used to create the installed control points. Control from adjoining, incorporated, or crossed roadway projects, which are currently in design, will be located and a comparison of the horizontal and vertical values will be shown. Developer shall provide survey records and reports to TxDOT upon request.

Developer may use an electronic field book to collect and store raw data. Developer shall preserve original raw data and document any changes or corrections made to field data, such as station name, height of instrument, or target. Developer shall also preserve raw and corrected field data in hardcopy output forms in a similar manner to conventional field book preservation.

Field survey data and sketches that cannot be efficiently recorded in the electronic field book shall be recorded in a field notebook and stored with copies of the electronic data.

All field notes shall be recorded in a permanently bound book. (Loose leaf field notes will not be allowed.) Developer shall deliver copies of any or all field notebooks to TxDOT upon request.

9.4 Construction Requirements

9.4.1 Units

All survey Work shall conform to Texas State Plane Coordinate System, in the U.S Survey Feet system of measurement. The surface adjustment factor for the Project is described in Section 9.3.1.

9.4.2 Construction Surveys

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

9.5 Deliverables

9.5.1 Survey Records

Developer shall deliver to TxDOT, for its review and acceptance, a listing of all primary and secondary control coordinate values, original computations, survey notes and other records including GPS observations and analysis made by Developer within ninety (90) days of Final Acceptance.

9.5.2 Final ROW Surveying and Mapping

Developer shall coordinate with TxDOT regarding the assignment of right of way Control Section Job (CSJ) numbers for each new mapping project.

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

9.5.3 ROW Monuments

Upon final submittal of the ROW documents to TxDOT, Developer shall set Type II Monuments, using permanent and stable monuments as defined in Section 663.17 of the *General Rules of Procedures and Practices of the Texas Board of Professional Land Surveying* (TBPLS), all significant points along all ROW lines of the Project including the following:

a) Points of curvature (PCs)

b) Points of tangency (PTs)

c) Points of intersection (PIs)

d) Points of compound curvature (PCCs)

e) Points of reverse curvature (PRCs)

f) All intersecting crossroad ROW lines and all property line intersections with the ROW line. These monuments shall be 5/8-inch iron rods, driven just below surface level, capped by a TxDOT-labeled aluminum cap (rod-and-cap monument)

g) All beginning and ending points of control of access (denied) lines

Upon completion of the ROW acquisition and all construction work, such that the final ROW lines will not be disturbed by construction, Developer shall replace all rod-and-cap monuments located on the final ROW line at all points of curvature (PCs), points of tangency (PTs), points of intersection (PIs), points of compound curvature (PCCs), and points of reverse curvature (PRCs), and all intersecting crossroad ROW lines, with TxDOT Type II monuments (constructed according to current TxDOT specifications). Developer shall monument with a TxDOT Type II monument all final ROW lines where the distance between such significant ROW line points exceeds 1500 feet. ROW line intersections with property lines shall remain monumented by a ½-inch iron rod with a TxDOT aluminum cap (rod-and-cap monument).

Developer shall reset all disturbed ROW monuments in reference to the appropriate x, y, z data.

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

9.5.4 Record Drawings and Documentation

Developer shall submit the following as part of the Record Drawings and as a condition of Final Acceptance:

a) A listing of all primary and secondary control coordinate values, original computations and other records including Global Positioning System (GPS) observations and analysis made by Developer

b) Copies of all survey control network measurements, computations, unadjusted and adjusted coordinate and evaluation values; and

c) Survey records and survey reports.

Developer shall produce reports documenting the location of the as-built alignments, profiles, structure locations, Utilities, survey control monuments and ROW monuments. These reports shall include descriptive statements for the survey methods used to determine the as-built location of the feature being surveyed. Developer's as-built data shall include the coordinate types (x, y, and/or z) and feature codes in the same format in which the preliminary construction data was generated. Where data has been provided to Developer from TxDOT in an x, y, z only coordinate format, or z only coordinate format, Developer shall provide TxDOT with data in an x, y, z only coordinate format or z only coordinate format.

10 GRADING

10.1 General Requirements

Developer shall conduct all work necessary to meet the requirements of grading, including clearing and grubbing, excavation and embankment, removal of existing buildings, pavement and miscellaneous structures, subgrade preparation and stabilization, dust control, aggregate surfacing and earth shouldering, in accordance with the requirements of this Section 10 and the TxDOT *Standard Specifications (2004)*.

Developer shall demolish or abandon in place, all existing structures within the Project ROW, including but not limited to, pavements, bridges, and headwalls that are no longer required for service, or are required to be treated as described in Section 4 (Environmental). Any features that are abandoned in place shall be removed to at least 2 feet below the final finished grade or 1 foot below the pavement stabilized subgrade and drainage structures. Developer shall ensure that abandoned structures are structurally sound after abandonment.

10.2 Preparation within Project Limits

Developer shall develop, implement, and maintain, for the Term, a Demolition and Abandonment Plan that considers types and sizes of Utilities and structures that will be abandoned during the Term. The plan shall ensure that said structures are structurally sound after the abandonment procedure. At least 60 days prior to NTP2, Developer shall submit to TxDOT for Approval the Demolition and Abandonment Plan.

TxDOT reserves the right to require Developer, at any time to salvage and deliver to a location designated by TxDOT within the TxDOT District in which the Project is located, any TxDOT-owned equipment and materials in an undamaged condition.

Unless otherwise specified by TxDOT, the material from structures designated for demolition shall be Developer's property. All material removed shall be properly disposed of by Developer outside the limits of the Project.

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

10.3 Slopes and Topsoil

Developer shall meet the requirements of TxDOT's *Roadway Design Manual* and TxDOT's *Roadside Design Guide* regarding design limitations and roadside safety guidelines associated with the design of slopes along roadways. Developer shall adjust grading to avoid and minimize disturbance to the identified waters of the U.S.

Developer shall perform finished grading and place topsoil in all areas suitable for vegetative slope stabilization (and areas outside the limits of grading that are disturbed in the course of the Work) that are not paved. Developer shall use only materials and soils next to pavement layers that do not cause water or moisture to accumulate in any layer of the pavement structure. For areas outside Developer's limits of maintenance, Developer shall provide stable slopes. For slopes steeper than 4:1, Developer shall submit to TxDOT a slope stability analysis that demonstrates the adequacy of Developer's design. Developer shall submit the slope stability analysis to TxDOT for Approval with the Released for Construction Documents.

For slopes steeper than 4:1, Developer shall construct concrete riprap.

11 ROADWAYS

11.1 General Requirements

The objectives of the Project include the provision of a safe, reliable, cost-effective, and aesthetically-pleasing corridor for the traveling public. The requirements contained in this Section 11 provide the framework for the design and construction of the roadways to help attain the Project objectives.

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

11.2 Design Requirements

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

The Project roadways shall be designed to incorporate roadway appurtenances, including fences, noise attenuators, barriers, and hazard protection as necessary to promote safety and to mitigate visual and noise impacts on neighboring properties.

11.2.1 Control of Access

Unless shown to be deleted in the Schematic Design, Developer shall maintain all existing property accesses, including those not shown on the schematic, and shall not revise control of access without TxDOT review and the written agreement of the affected property owner. Developer must confirm that access needs meet the requirements of TxDOT's Access Management Manual.

Developer must coordinate with landowner when tying-in to private property; must replace necessary signs, mailboxes, fences, landscape features and coordinate all access.

11.2.2 Roadway Design Requirements

Developer shall design the Elements of the Project to meet or exceed the geometric design criteria shown in Table 11-1.

Table 11-1: Roadway Design Criteria

Design Elements	Mainlanes[1]	Frontage Roads[4]	Ramps/ Direct Connectors[2, 3]	Collector	Low-speed Arterials	High-speed Arterials
Roadway Classification	Urban Freeway	Urban Frontage Road	Freeway Ramp/ Freeway Connector	Urban Collector	Urban Arterial	Urban Arterial
Design speed	70 mph	45 mph	50 mph	30 mph	45 mph	50 mph
Horizontal stopping sight distance (SSD)	730'	360'	425'	200'	360'	425'
Minimum Radius	2040'	643'	833'	300'	643'	833'
Max. Super elevation Rate	6%	6%	6%	4%	4%	6%

Relative Gradient (%) for Superelevation Transition	0.40%	0.54%	0.50%	0.66%	0.54%	0.50%
Max. Degree of Deflection w/o Horiz. Curve	0°15’0”	0°30’0”	0°15’0”	0°30’0”	0°30’0”	0°15’0”
Lane Widths	12’	12’	14’ (1 lane ramps/DC’s) 12’ (2+ lane ramps/DC’s)	12’	12’	12’
Side Slope Rates -within CZ -outside CZ	 6:1 4:1	 6:1 4:1	 6:1 4:1	 6:1 4:1	 6:1 4:1	 6:1 4:1
Clear Zone Width	30’	4’ from curb face (curbed) 10’ (uncurbed)	16’	4’ from curb face (curbed) 10’ (uncurbed)	4’ from curb face (curbed) 10’(uncurbed)	10’
Sidewalk Width	N/A	5.5’	N/A	5’	5’	5’
Sag Curve Min. K-Value	181	79	96	37	79	96
Crest Curve Min. K-Value	247	61	84	19	61	84
Maximum Grade	4%	8%	5%	9%	6%	6%
Minimum Grade	0.5%	0.35%	0.35%	0.35%	0.35%	0.35%
Maximum Cross Slope	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Vertical Clearance -Under/Overpass Roadway -Over Railroad[6]	 16.5’[5] 23’4”	 16.5’ 23’4”	 16.5’ 23’4”	 16.5’[5] 23’4”	 16.5’ 23’4”	 16.5’ 23’4”
Design Vehicle	WB-62	WB-62	WB-62	WB-62	WB-62	WB-62
Usable Shldr Widths -Inside -Outside	 10’ 10’	 N/A	 4’ 8’	 N/A	 N/A	 N/A

Table 11-1 Notes:

1. For mainlane alignment SH 286 (STA 1169+20 to STA 1181+80), the vertical curve shall meet a minimum design speed of 65 mph.
2. For ramp alignment Ramp UU, the vertical curves shall meet a minimum design speed of 35 mph.
3. For ramp alignment Ramp XX, the vertical curves shall meet a minimum design speed of 45 mph.
4. For the NB SH 286 frontage road alignment from Lipan Street to the EB I-37 frontage road, the vertical curves shall meet a minimum design speed of 35 mph.
5. Widened existing I-37 mainlanes shall meet existing vertical clearance over Nueces Bay Boulevard. A replacement of Nueces Bay Boulevard would require a minimum of 16.5’ vertical clearance.
6. I-37 mainlanes shall meet existing vertical clearance over Texas-Mexican rail crossing.

Developer will provide for future growth on elevated sections.

Developer shall design the Elements of the Project based on the roadway classifications detailed in Table 11-2: Roadway Classifications.

Table 11-2: Roadway Classifications

Roadway Name	Description	Classification
US 181	US 181 from Beach Avenue to I-37	Mainlanes
SH 286	SH 286 from I-37 to Laredo Street	Mainlanes
I-37	I-37 from Nueces Bay Boulevard to SH 286	Mainlanes
I-37	I-37 from SH 286 to Mesquite Street	High Speed Arterial
SB181WB37	Southbound US 181 to westbound I-37	Direct connector
EB37NB181	Eastbound I-37 to northbound US 181	Direct connector
NB286WB37	Northbound SH 286 to westbound I-37	Direct connector
EB37SB286	Eastbound I-37 to southbound SH 286	Direct connector
Burleson Street	Burleson Street crossing under US 181	Collector
Lake Street	Lake Street crossing under US 181	Collector
Leopard Street	Leopard Street crossing under SH 286	Low Speed arterial
Comanche Street	Comanche Street crossing over SH 286	Collector
Staples Street[2]	Staples Street crossing over I-37	Low Speed arterial
Port Avenue	Port Avenue crossing under I-37	Low Speed arterial
Broadway Blvd.[1]	Broadway Boulevard from Harbor Drive to I-37	Low Speed arterial
Belden Drive[1]	Belden Drive crossing Broadway Boulevard	Collector
Power Street[1]	Power Street crossing Broadway Boulevard	Collector
Palo Alto Street[1]	Palo Alto Street crossing Broadway Boulevard	Collector
Fitzgerald Street[1]	Fitzgerald Street crossing Broadway Boulevard	Collector
Resaca Street[1]	Resaca Street crossing Broadway Boulevard	Collector
Hughes Street[1]	Hughes Street crossing Broadway Boulevard	Collector
Brewster Street[1]	Brewster Street crossing Broadway Boulevard	Collector
Hirsch Street/ Port Avenue[1]	Hirsch Street/ Port Avenue crossing Broadway Boulevard	Low Speed arterial
Harbor Drive[1]	Harbor Drive crossing Broadway Boulevard	Collector
BE SBER	Beach Street to US 181 southbound entrance ramp	Ramp
BE NBXR	US 181 to Beach Street northbound exit ramp	Ramp
BU SBXR	US 181 to Burleson Street southbound exit ramp	Ramp
37 NBER	Leopard Street/ I-37 to US 181 northbound entrance ramp	Ramp
37 SBXR	US 181 to Leopard Street/ I-37 southbound exit ramp	Ramp
37 NBXR	SH 286 to Leopard Street/ I-37 northbound exit ramp	Ramp
ST WBXR	I-37 to Staples Street/US 181-SH286 westbound exit ramp	Ramp
ST EBXR	I-37 to Staples Street eastbound exit ramp	Ramp
ST WBER	Staples Street to I-37 westbound entrance ramp	Ramp
181 EBER	US 181-SH286 to I-37 eastbound entrance ramp	Ramp
NU WBXR	I-37 to Nueces Bay Boulevard westbound exit ramp	Ramp
NU EBER	Nueces Bay Boulevard to I-37 eastbound entrance ramp	Ramp
PA WBER	North Port Avenue to I-37 westbound entrance ramp	Ramp
PA EBXR	I-37 to North Port Avenue eastbound exit ramp	Ramp
DC WBXR	US 181-SH286 to I-37 westbound DC to Nueces Bay Boulevard westbound exit ramp	Ramp

Table 11-2 Notes:

1. Part of Option 1 work; refer to Section 1.3.1.1.
2. Staples Street is to meet City of Corpus Christi C2 65' street type dimensions.

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

Developer shall not reduce storage lengths on intersections from what is shown in the schematic. Developer shall increase storage lengths to accommodate traffic design requirements.

Developer shall implement positive offset for opposing left-turn lanes at intersections.

Developer shall not deviate from the following vertical profile requirements:

a) Developer shall provide a minimum of 16.5' vertical clearance between the lowest point of the US 181/SH 286 overpass bridge structure to the highest point of the following crossing roadways: Beach Street and corresponding u-turns, Burleson Street and corresponding u-turns, Lake Street, I-37 mainlanes and frontage roads and Leopard Street.

b) Developer shall provide a minimum of 16.5' vertical clearance between the lowest point of the Comanche Street bent caps to the highest point of the US 181/SH 286 mainlanes.

c) Developer shall provide a minimum of 16.5' vertical clearance between the lowest point of the Staples Street, Tancahua Street and Carancahua Street bridge bent caps to the highest point of the I-37 mainlanes.

d) Developer shall provide a minimum of 16.5' vertical clearance between the lowest point of the Stillman Avenue pedestrian bridge bent caps to the highest point of the I-37 mainlanes and eastbound and westbound frontage roads.

e) Developer shall provide a minimum of 16.5' vertical clearance between the lowest point of the I-37/US 181/SH 286 direct connects to the highest point of the crossing US 181/SH 286 mainlanes, ramps and frontage roads.

f) Developer shall provide a minimum of 16.5' vertical clearance between the lowest point of the I-37/US 181/SH 286 direct connects to the highest point of the crossing I-37 mainlanes, ramps and frontage roads.

g) Developer shall provide a minimum of 16.5' vertical clearance between the lowest point of the I-37 mainlanes and ramp overpass bridge structure to the highest point of the US 181/SH 286 frontage roads, North Port Avenue and the U-turn east of North Port Avenue.

h) Developer shall meet existing vertical clearance between the lowest point of the I-37 mainlanes overpass bridge structure to the highest point of Nueces Bay Boulevard.

i) Developer shall provide a minimum of 23.5' vertical clearance between the lowest point of any overpass bridge structure to the highest point of any rail crossing; except for the Texas-Mexican Rail crossing which shall meet existing vertical clearance.

11.2.2.1 Superelevation

In areas where proposed ramps are to connect to existing pavement, Developer's design may retain existing superelevation. Pavement widening may be constructed by extending the existing pavement cross slope. Superelevation transitions shall be designed and constructed such that zero percent cross-slopes will not occur on grades flatter than 0.35 percent.

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

11.2.2.2 Roadway Design Deviations

The approved roadway deviations are as follows:

a) None

11.2.3 Miscellaneous Roadway Design Requirements

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

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

Slope for driveways shall not exceed 12:1.

Developer shall design and construct the local streets as shown in Table 11-1.

Developer shall be responsible for determining proper locations for impact attenuators within the Project limits. If impact attenuators are used, Developer shall comply with TxDOT's *Roadway Design Manual* and the AASHTO *Roadside Design Guide* and shall use:

a) REACT Cushion;
b) HEART Cushion; or
c) Equal system, approved by TxDOT.

Developer shall comply with the requirements in Section 14 pertaining to railroad maintenance roads.

When utilizing curb adjacent to flexible pavement, Developer shall design and construct Type II curb and gutter in accordance with TxDOT standard CCCG-12 and shall include steel reinforcement.

On Frontage Road sections, Developer shall design and construct a Type II curb on the outside and a mountable curb on the inside of the roadway.

Developer must meet all FAA requirements and perform all related coordination.

12 DRAINAGE

12.1 General Requirements

Efficient performance of the drainage system is an integral part of the performance of the Project. Developer shall account for all sources of runoff that may reach the Project, whether originating within or outside the Project ROW, in the design of the drainage facilities.

If existing drainage patterns are revised during the Project design, then Developer shall design and construct a solution that does not adversely impact property owners outside the ROW.

12.2 Administrative Requirements

12.2.1 Data Collection

To establish a drainage system that complies with the requirements and accommodates the historical hydrologic flows in the Project limits, Developer is responsible for collecting all necessary data, including those elements outlined in this Section 12.2.1.

Developer shall collect available data identifying all water resource issues, including water quality requirements as imposed by State and federal government regulations; National Wetland Inventory and other wetland/protected waters inventories; in FEMA mapped floodplains; and official documents concerning the Project, such as the FEIS or other drainage and environmental studies. Water resource issues include areas with historically inadequate drainage (flooding or citizen complaints), environmentally sensitive areas, localized flooding, maintenance problems associated with drainage, and areas known to contain Hazardous Materials. Developer shall also identify watershed boundaries, protected waters, county ditches, areas classified as wetlands, floodplains, and boundaries between regulatory agencies (e.g., watershed districts and watershed management organizations).

Developer shall acquire all applicable municipal drainage plans, watershed management plans, and records of citizen concerns. Developer shall acquire all pertinent existing storm drain plans and/or survey data, including data for all culverts, drainage systems, and storm sewer systems within the Project limits. Developer shall also identify existing drainage areas that contribute to the highway drainage system and the estimated runoff used for design of the existing system.

Developer shall obtain photogrammetric and/or geographic information system (GIS) data for the Project limits that depicts the Outstanding National Resource Waters and/or impaired waters as listed by the TCEQ. Developer shall conduct surveys for information not available from other sources.

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

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

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

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

b) Hydraulic notes, models, and tabulations

c) Storm sewer drainage report

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

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

f) Correspondence file

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

h) Video inspection of system

12.2.2 Coordination with Other Agencies

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

12.3 Design Requirements

Developer shall design all Elements of the drainage facilities in accordance with the applicable design criteria, Good Industry Practice and the *TxDOT Hydraulic Design Manual*.

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

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

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

Developer may make use of existing drainage facilities, provided overall drainage requirements for the Project are achieved and the combined drainage system functions as intended.

Developer shall base its Final Design on design computations and risk assessments for all aspects of Project drainage. Developer's proposed drainage system shall also maintain or improve the existing drainage and shall replace the existing drainage system where necessary within the limits affected by the project.

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

Developer shall analyze and design drainage Elements using the following software packages:

a) GEOPAK Drainage for storm sewer;

b) HEC-HMS for detention pond routing; and

c) HEC-RAS for no-rise calculation.

d) Required software for channels

Use of other drainage software by the Developer shall be subject to Approval by TxDOT and any appropriate regulatory agencies.

Developer shall use a minimum of 10 minutes for times of concentration for drainage areas and catch basins.

Developer shall meet slope requirements from the *TxDOT Hydraulic Design Manual*

PI's are to be held to 20; French Drains are to be used when possible.

Developer shall define water table requirements. In areas where high water table is encountered; French Drains are to be used.

Developer is to use flap gates at outfalls.

Developer shall ensure that outfall channels are available for existing and proposed storm sewer systems. Developer shall coordinate with other entities as necessary to provide outfall channels and to determine maintenance responsibilities of existing and possible proposed channels. Developer shall provide hydraulic analysis of channels for appropriate design frequency.

12.4 Surface Hydrology

12.4.1 Design Frequencies

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

Table 12-1: Drainage Design Frequencies

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

Notes.

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

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

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

A 50-yr Drainage Design Frequency shall be assumed at the drainage low point at Brownlee Boulevard.

12.4.1.1 Hydrologic Analysis

Developer shall design for the future changes in land use that may affect the magnitude of runoff and therefore the design capacity of drainage structures. Developer shall incorporate anticipated changes in the basin land use, characteristics, or water operations into the hydrologic parameters. Developer shall design all drainage facilities to accommodate probable land use assuming a 150 foot development strip for drainage basin delineation in accordance with current development policy.

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

12.4.2 Storm Sewer Systems

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

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

a) Drainage area maps for each storm drain inlet with pertinent data, such as boundaries of the drainage area, topographic contours, runoff coefficients, time of concentration, and land use with design curve number and/or design runoff coefficients, discharges, velocities, ponding, and hydraulic grade line data.

b) Location and tabulation of all existing and proposed pipe and drainage structures. These include size, class or gauge, catch basin spacing, detailed structure designs, and any special designs.

c) Specifications for the pipe bedding material and structural pipe backfill on all proposed pipes and pipe alternates. All pipes are to receive Class C Bedding. Developer will provide and implement a backfill detail using the go-by located in the RID documents.

d) Complete pipe profiles, including pipe size, type, and gradient; station offsets from the centerline of the roadway; length of pipe; class/gauge of pipe; and numbered drainage structures with coordinate location and elevations.

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

Developer shall design all storm sewer systems such that the hydraulic grade line for the design frequency event at the curb line.

Runoff within the jurisdiction of the USACE shall be conveyed in accordance with applicable laws and permits.

Developer shall protect all storm sewer outlets based on the following volumes and requirements:

a) 0 to < 2fps: no protection required.

b) 2 to <8 fps: concrete riprap.

c) > 8 fps: utilize TxDOT's *Hydraulic Design Manual* and HEC-14.

Developer shall design storm sewer systems utilizing TxDOT Corpus Christi District standards.

12.4.2.1 Pipes

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

All pipes shall be reinforced concrete pipe.

The minimum reinforced concrete pipe size inside diameter shall be 24" for laterals, 24" for laterals placed under pavement, 24" for trunk lines and 18" for driveway crossings. The minimum box culvert height for proposed box culverts, inside dimension, shall be 3' feet.

Longitudinal trunklines shall not be placed behind retaining walls. Longitudinal trunklines can only be placed under roadways if there is access.

Manholes and Junction Boxes are to be poured the entire width of sidewalk; or shall be poured monolithically.

When extending existing corrugated metal pipe, Developer shall connect reinforced concrete pipe to existing corrugated metal pipe using a concrete collar.

12.4.2.2 Ponding

For the US 181/SH 286/I-37 mainlanes and ramps, Developer shall design drainage systems to limit ponding to the applicable shoulder width. For all other roadways, Developer shall design drainage systems to limit ponding to the widths described in Chapter 10, Section 2 of TxDOT's *Hydraulic Design Manual*.

12.4.3 Not Used

12.4.4 Detention Ponds

Developer shall complete design of the detention ponds to meet requirements for water quality, water quantity, and rate control, as determined by the Texas NPDES regulations. Developer shall assume and execute TxDOT's responsibilities and duties described in Section 5.

Developer shall design and construct detention ponds to prevent an increase in outfall volumes compared to the existing conditions. Developer shall ensure that detention ponds meet the requirements listed above by performing all required analyses. Such analyses shall include flood routing analysis, which includes a detailed routing analysis for ponds affected by significant environmental issues such as hazardous waste or groundwater concerns.

Developer shall design and construct detention ponds to provide adequate maintenance access.

Developer shall not over-excavate detention ponds to provide itself fill material.

12.4.5 Hydraulic Structures

12.4.5.1 Culverts

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

Where culvert design is influenced by upstream storage, Developer shall incorporate the analysis of the storage into the design of the culvert.

For all culverts, the maximum allowable headwater elevation for the design frequency shall not exceed one foot below the shoulder point of intersection elevation of the applicable roadway low point.

Culverts are classified as major or minor, as follows:

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

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

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

12.4.5.2 Bridges

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

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

12.4.5.3 Method Used to Estimate Flows

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

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

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

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

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

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

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

12.4.5.3.1 Design Frequency

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

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

Developer shall design mainlane, ramp and direct connector bridges for the 50-year storm with a minimum 2' of freeboard and shall design the mainlane, ramp and direct connector bridges to pass the 100-year storm with a minimum 1' of freeboard.

12.4.5.3.2 Hydraulic Analysis

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

12.4.5.3.3 Bridge/Culvert Waterway Design

For existing crossings, Developer shall analyze the existing structure with the proposed flows to ensure the headwater does not exceed allowable headwater. If this condition is not met, Developer shall design a replacement structure with sufficient capacity to pass the design-frequency flows and ensure the maximum headwater for any frequency event does not cause an adverse impact. Culvert extensions may increase the headwater elevation, but not above the maximum allowable headwater, with respect to adjacent property and floodplain concerns. Existing culverts that are extended shall, at minimum, be the same size and have the same capacity as the existing culvert.

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

12.4.5.3.4 Bridge Deck Drainage

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

Open deck drains are not permissible for bridges passing over waterways, roadways, or as prescribed in these Technical Provisions. If ponding width limits require, runoff shall be conveyed in a closed storm sewer system as specified in Section 13.2.1.17, to the roadway drainage system below. Bridge downspouts shall be a minimum size of 8 inches in diameter. The bridge deck drainage system shall outlet at the bottom of the substructure either into a storm sewer system or into an open channel and in no case shall be allowed to discharge against any part of the structure. Inlets are required on the bridge to capture stormwater as required in this Section 12.

12.4.5.3.5 Drainage Report for Major Stream Crossings

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

FEMA Special Flood Hazard Area (SFHA)

a) FIRMette

b) Discussion of SFHA and implications

Hydrology

a) Drainage area maps with watershed characteristics, hardcopy

b) Hydrologic calculations (where computer software is used, both hardcopy and electronic input and output files)

c) Historical or site data used to review computed flows

Hydraulics and Recommended Waterway Opening and/or Structure

a) Photographs of Site (pre- and post-construction)

b) General plan, profile, and elevation of recommended waterway opening and/or structure

c) Calculations – hardcopy of output, as well as electronic input and output files for all computer models used for final analysis or for permit request, as well as summary of the basis of the models

d) Cross-sections of waterway (Developer shall provide a hard copy plot, plus any electronic data used)

e) Channel profiles

Scour Analysis

a) Channel cross-sections at bridge showing predicted scour

b) Calculations and summary of calculations, clearly showing predicted scour and assumptions regarding bridge opening and piers used to calculate predicted scour

c) Discussion of review of long-term degradation/aggradation and effects

d) Recommendation for abutment protection

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

Major stream crossings are waterways with a FEMA studied SFHA or requiring a bridge class structure, which is defined as any bridge or a culvert with a total opening width greater than or equal to 20 feet. Any other waterway will be by default a minor stream crossing.

12.5 Drainage Design Report

A preliminary Drainage Design Report shall be submitted with prefinal set of construction plans. The preliminary Drainage Design Report shall address all items to be included in the Final Drainage Design Report. Within 30 days of Substantial Completion, Developer shall submit to TxDOT, as part of the record set documents, a Final Drainage Design Report, which shall be a complete documentation of all components of the Project's drainage system. At a minimum, the Report shall include:

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

b) Hydraulic notes, models, and tabulations

c) Bridge and culvert designs and reports for major stream crossings including all items listed in Section 12.4.5.3.5

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

e) Correspondence file

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

g) Storm sewer drainage reports (if applicable)

h) Analysis of tailwater elevation and outfalls on closed systems and culverts.

12.6 Construction Requirements

Developer shall design drainage to accommodate construction staging. The design shall include temporary erosion control ponds and other Best Management Practices needed to satisfy the NPDES and other regulatory requirements. The water resources notes in the plans shall include a description of the drainage design for each stage of construction.

The drainage system shall be designed to a 2-yr design frequency during construction.

13 STRUCTURES

13.1 General Requirements

The structural Elements of the Project, including bridges, culverts, drainage structures, signage supports, illumination assemblies, traffic signals, retaining walls, and noise walls, shall be designed and constructed in conformance with the requirements of the Contract Documents, the current AASHTO *LRFD Bridge Design Specifications*, and the current AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* except where directed otherwise by the TxDOT *Bridge Design Manual – LRFD* and the TxDOT *Geotechnical Manual*. Construction of structural Elements shall meet the requirements of Attachment 13-1, Structure Provisions. Developer may use the current TxDOT *Bridge Detailing Guide* for detailing of Project Elements.

For bridges, walls, bridge class culverts, sign structures and other miscellaneous structures, a Corridor Structure Type Study and Report shall be submitted to TxDOT for review and comment. At a minimum, structural concepts, details and solutions, soil parameters, hydraulics, environmental requirements, wetland impacts, safety, highway alignment criteria, constructability, aesthetics requirements, and continuity for the Project shall be evaluated in the Corridor Structure Type Study and Report. Evaluation of existing structures that will be retained shall be included in the Corridor Structure Type Study and Report. The Corridor Structure Type Study and Report shall clearly define Developer's action to achieve the service life specified in the applicable requirements for Project bridges, walls, culverts and miscellaneous structures.

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

13.2 Design Requirements

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

All Elements of new structures and exterior caps, columns, beams, railing, and retaining walls of widened structures shall include aesthetic treatments in accordance with the aesthetic guidelines in Section 15.

Provide a copy of all electronic files, paper files, and calculation design notebooks to TxDOT upon TxDOT's request.

13.2.1 Bridge

Unless otherwise noted, design for all roadway and pedestrian structural Elements shall be based on the Load and Resistance Factor Design (LRFD) methodology included in TxDOT's *Bridge Design Manual – LRFD* and the most recent AASHTO *LRFD Bridge Design Specifications*, including all interim revisions.

Steel bridge design shall comply with *TxDOT Preferred Practices for Steel Bridge Design, Fabrication, and Erection*.

Pedestrian bridges shall additionally conform to the requirements of AASHTO LRFD *Guide Specifications for Design of Pedestrian Bridges*.

Bridges crossing over the Project shall, at a minimum, be designed to accommodate the Project and all planned expansions or updates of each facility by the City of Corpus Christi and Corpus Christi Metropolitan Planning Organization as designated in their current transportation master plan. Alignments shall meet the requirements indicated in Section 11 for the functional classification of each roadway.

Developer shall complete a load rating and condition survey of existing structures to be widened. Ratings shall be based on current TxDOT procedures.

13.2.1.1 Structural System and Configuration

The New Harbor Bridge shall be a cable-stayed bridge with composite concrete deck. Developer may provide separate superstructures or a continuous superstructure for northbound and southbound traffic. For separate superstructures, the minimum separation between the two superstructures shall be 10 feet.

For all other bridges, other bridge types and Elements may be used, but will be allowed only if Developer can demonstrate to the satisfaction of TxDOT that the design of the bridge type and Elements will meet the functional requirements of the Project.

Except as noted, widenings of existing bridges are prohibited. The following bridges may be widened:

a) IH 37 over Nueces Bay Blvd.; and

b) SH 286 over local road between Laredo St. and Mussett St.

The minimum vertical clearance for the New Harbor Bridge over the Corpus Christi Ship Channel shall be as follows and as shown in Attachment 13-2, New Harbor Bridge Clearance Requirements:

a) 175 feet between bulkhead lines;

b) 185 feet for a 688 foot section centered over the channel measured normal to the channel; and

c) 205 feet for a 400 foot section centered over the channel measured normal to the channel.

The minimum vertical clearance for superstructure Elements over the New Harbor Bridge, including the shared-use path, shall be 17.5 feet.

Fracture critical members shall not be used for bridges. All steel Elements subject to tension shall be designed as load-path-redundant-members or system-redundant-members.

Developer shall proportion bridge spans to avoid uplift at supports. Permanent tie-downs are prohibited.

For precast concrete beam and steel girder superstructures, a minimum of four beams or girders shall be used per bridge span.

Timber shall not be used for permanent bridge Elements.

13.2.1.2 Service Life Design

Developer shall design the New Harbor Bridge with materials and details that meet service life requirements. The foundations, towers, substructures, superstructure framing system, stay cables, and deck shall be considered non-replaceable components and shall have a minimum service life of 75 years. All other components shall achieve the minimum service life specified in Table 13-1.

Table 13-1: Minimum Service Life for Replaceable Components

Replaceable Components	Minimum Service Life (Years)
Bearings	50
Expansion joints	30
Bridge Railing	60
Pedestrian-Only Railings	60
Drainage system	60
Wearing surface	40
Stay cable dampers	40
External post-tensioning cables	60
Inspection travelers and components	60
Internal access ladders and platforms	60
Electrical and mechanical parts	30
Galvanizing of structural steel	35
Metalizing of structural steel	35
Lightning protection system	30
Navigational lighting	30
Other proposed components	As negotiated

Service life design for concrete Elements shall be in accordance with ACI 365.1R *Service-Life Prediction–State-of-the-Art Report*. Service life shall be defined as the time in service until spalling of concrete occurs.

Active electric current cathodic protection and passive sacrificial anodes shall not be used to mitigate expected corrosion effects in structures, including piles.

Developer shall prepare a detailed Corrosion Protection Plan for the New Harbor Bridge. The Corrosion Protection Plan shall include:

a) An executive summary describing the overall approach to achieving the required service life for the bridge components;

b) Identification of each bridge component with the corresponding environmental exposure conditions (e.g., buried, submerged, exposed to atmosphere, exposed to corrosive chemicals);

c) Identification of relevant degradation and protective mechanisms for each bridge component. Quantify degradation processes and resistances to these processes with respect to time. Models shall use a probabilistic approach to evaluate the time-related changes in performance depending on the component, environmental conditions, and any proposed protective measures. Models shall be listed in the plan;

d) Expected service life of each bridge component based on the proposed material, exposure condition, relevant degradation mechanism, and any proposed protective measures, taking into account the proposed inspection/maintenance schedule. List any corrosion allowances and thresholds used. Include the level of reliability or probability of the predicted service life for each Element as well as the expected interval of replacement or renewal of the protective measures within the service life duration (e.g., thickness of coats, number of times to recoat paint that protects steel members);

e) Construction procedures to be implemented to ensure that high quality products are achieved (including ensure uniform compaction of the concrete, adequate concrete cover, proper curing for the Element);

f) Summary, in a tabular format, for each component listed in Table 13-1 and other relevant Elements;

g) A list of the manufacturers of all proposed coatings, inhibitors, sealers, and membranes;

h) A schedule for corrosion inspection of the bridge components; and

i) A proposed maintenance schedule for items and materials that could be affected by corrosion.

Developer shall submit the Corrosion Protection Plan to TxDOT. The Corrosion Protection Plan shall be subject to TxDOT Approval.

13.2.1.3 Redundancy

Steel Elements shall be considered load-path-redundant-members if they are aligned along the longitudinal axis of the bridge, there are two or more additional Elements between points of support that work together to resist applied loads, and upon failure of the Element, the additional Elements have sufficient capacity to carry the load redistributed to them. TxDOT in its sole discretion shall determine whether a steel Element is a load-path-redundant-member.

Steel Elements shall be considered system-redundant-members if, through analysis, Developer demonstrates that an Element gains its redundancy by system behavior and TxDOT approves the analysis. System redundancy shall be analyzed at the Extreme Event III limit state. System redundancy analysis results shall demonstrate the capacity-to-demand ratios for all members are greater than or equal to 1.0.

The following load combinations shall be analyzed as part of the Extreme Event III limit state:

a) $1.25DC + 1.5DW + 0.75(LL+IM) + 1.1FDF$

Locked-in forces (EL) shall also be included in the above load combinations. Developer shall determine the magnitude, load factors, and application of locked-in forces.

The fracture dynamic force, *FDF*, for stay cables shall be developed in accordance with Section 5.5 of the current PTI *Recommendations for Stay-Cable Design, Testing and Installation*. The *FDF* for other Elements shall be developed based on the results of a 3-D dynamic (time history) model. Developer may submit to TxDOT, for Approval, justification for the non-use of a *FDF* for Elements.

Developer shall use the following parameters at the Extreme Event III limit state:

a) Design vehicle live load shall be in accordance to Article 3.6.1.2 of the AASHTO *LRFD Bridge Design Specifications*;

b) Number of design lanes shall be the integer part of the clear roadway width divided by 12 feet;

c) Multiple presence factors shall be in accordance to Article 3.6.1.1.2 of the AASHTO *LRFD Bridge Design Specifications*;

d) A resistance factor of 1.0 shall be used;

e) A fracture can occur at any point on a member or connection, but multiple fractures occurring simultaneously shall not be considered; and

f) A fracture may occur in any steel Element resisting tensile stresses.

Developer shall analyze total section fracture at the Extreme Event III limit state for the following Elements:

a) All system-redundant-members;

b) One stay cable;

c) One floor beam; and

d) One edge girder.

Developer shall prepare a Redundancy Report that validates the design of the New Harbor Bridge satisfies the requirements for redundancy. At a minimum, the report shall include the following:

a) Procedures and methodologies used to achieve redundancy of the New Harbor Bridge;

b) Procedures used to calculate the magnitude of the fracture dynamic force and how it was applied;

c) Calculation results validating the achievement of redundancy;

d) Graphic representations depicting structural details described in the report; and

e) Summary identifying all members of the New Harbor Bridge in tension and how they achieve redundancy.

The Redundancy Report shall be signed and certified by the Lead New Harbor Bridge Design Engineer. Developer shall submit the Redundancy Report to TxDOT. The Redundancy Report shall be subject to TxDOT Approval.

13.2.1.4 Load Factors and Combinations

The New Harbor Bridge shall be designed with an operational importance factor of 1.05. The operational importance factor shall be applied to the superstructure, including stay cables, and the towers.

The following load combinations shall be included in the design of the New Harbor Bridge at the Extreme Event limit state:

a) $\gamma_p DC + \gamma_p DW + 1.75(LL+IM) + 1.0FR$ at 180 percent of the 100-year computed scour;

b) $\gamma_p DC + \gamma_p DW + 1.0WA + 1.0FR + 1.40\ WS$ at 70 percent of the 100-year computed scour; and

c) $\gamma_p DC + \gamma_p DW + 1.0WA + 1.0FR + 1.00\ CV$ at 60 percent of the 100-year computed scour.

13.2.1.5 Live Loads

Developer shall design all roadway bridges and bridge class culverts to accommodate the following live loads:

a) An HL-93 truck or a tandem truck plus lane load as defined in the AASHTO *LRFD Bridge Design Specifications* shall be utilized for bridges except pedestrian bridges.

b) Pedestrian bridges and sidewalks of vehicular bridges shall be loaded in accordance with requirements in the AASHTO *LRFD Bridge Design Specifications* and the AASHTO *Guide Specifications for Design of Pedestrian Bridges*. In addition, all pedestrian bridges shall also be designed for an AASHTO H-10 truck live load as defined in the AASHTO *Standard Specifications for Highway Bridges*, 17th Edition.

c) Existing structures to remain shall meet HS-20 inventory load rating according to AASHTO *Standard Specifications for Highway Bridges*, 17th Edition. Structures failing to meet this standard shall be replaced using LRFD design and HL-93 loading.

d) Existing bridge class culverts to remain shall meet HS-20 operating load rating according to AASHTO *Standard Specifications for Highway Bridges*, 17th Edition. Structures failing to meet this standard shall be replaced using LRFD design and HL-93 loading.

e) Widenings shall meet HS-20 inventory load rating for existing portions to remain. Widened portion shall meet HL-93 loading criteria. Designate both existing and widening loading on bridge layout.

13.2.1.6 Water Loads

Developer shall ensure that bridges crossing over waterways withstand a 500-year frequency event with no loss of structural integrity in accordance with *FHWA Hydraulic Engineering Circular (HEC)-18, HEC-23, and HEC-25*.

The mean high water elevation shall be defined as NAVD 88 1.00.

13.2.1.7 Wind Loads

Wind loading, analysis, and design for the New Harbor Bridge shall be determined based on site-specific climatology and wind tunnel testing in accordance with ASCE/SEI 7. Both static and dynamic wind effects shall be included in the analysis. The Risk Category for the wind analysis shall be III.

For all other bridges, wind loading, analysis, and design shall be in accordance with Article 3.8 of AASHTO *LRFD Bridge Design Specifications*.

13.2.1.7.1 Climatology and Wind Design

Developer shall prepare a site-specific Climatology and Wind Report based on data obtained from regional meteorological stations in the vicinity of the Project and the New Harbor Bridge geometry. The report shall thoroughly discuss the criteria, analysis, and design methodologies, including proposed wind tunnel testing, for determining the appropriate New Harbor Bridge wind design loads and ensuring the aerodynamic stability of the New Harbor Bridge. The report and all testing shall be submitted to TxDOT and shall be subject to TxDOT Approval.

The Climatology and Wind Report shall include:

a) Climatology and wind study that includes:
   - Gust speeds and return period for the site;
   - Extreme wind events (weather events, tropical storm and hurricane category) for construction;
   - Design wind directionality and distribution;
   - Design wind speeds at the New Harbor Bridge deck height for completed structure and during construction;
   - Vertical wind profile;
   - Design wind speed for aerodynamic stability (flutter stability) for completed structure and during construction as 10-minute mean wind speed; and
   - Turbulence properties at bridge site during each construction stage and in its final state.

b) Wind tunnel testing program that includes:
   - Description of the wind tunnel testing program;
   - Description of all modeling and test procedures; and
   - Method for modeling all stay cable attachments.

c) Design methodologies that include:
   - Design codes;
   - Wind design speeds and pressures;
   - Serviceability for pedestrian comfort;

- Wind load combinations including both static and dynamic wind effects;
- Aeroelastic phenomena of vortex excitation, galloping, flutter, divergence, and rain-wind induced vibration; and
- Computer models of the bridge that incorporates the results of climatology study and wind tunnel tests.

At a minimum, wind effects for design of the New Harbor Bridge shall include the following mean return periods:

a) 100-year return period wind speed for structural design;

b) 10,000-year return period wind speed for verifying aeroelastic stability;

c) 20-year return period wind speed for structural design during critical construction stages; and

d) 1,000-year return period wind speed for verifying the aeroelastic stability during critical construction stages.

13.2.1.7.2 Sectional Model Testing

Complete sectional model wind tunnel testing to verify satisfactory performance of the New Harbor Bridge's aerodynamic stability.

Submit a Sectional Model Testing Report containing the following information, at a minimum:

a) Section model testing information including objectives and criteria, model description, wind tunnel test procedures, and angles of wind attack to be included;

b) Results of wind buffeting including background information, mean and background fluctuation wind loads, inertial loads due to wind-induced bridge motions, and simplified wind load distributions for structural design; and

c) Static aerodynamic coefficients (lift, drag, and moment), aeroelastic flutter coefficients, and vortex-induced aerodynamic motions.

13.2.1.7.3 Aeroelastic Model Testing

Developer shall perform full aeroelastic model testing of the New Harbor Bridge, including approach spans adjacent to each end of the New Harbor Bridge. Approach span lengths to be included in the model shall be determined by Developer. The model shall include the New Harbor Bridge's completed form as well as critical construction stages and the presence of the Existing Harbor Bridge during construction.

Developer shall prepare a Wind Engineering Report with the results of the full aeroelastic model testing of the bridge to determine wind design forces based on the wind tunnel tests findings. At a minimum, the Wind Engineering Report shall contain the following:

a) Description of the aeroelastic model and damping;

b) Description of the wind tunnel simulation;

c) Description of the wind tunnel test and instrumentation;

d) Aerodynamic stability from wind tunnel test results;

e) Response to turbulent winds from wind tunnel test results;

f) Response comparisons between the stability and buffeting analysis and the test results;

g) Comparison of simultaneous peak moments at the base of the tower; and

h) Conclusions and recommendations.

13.2.1.8 Thermal Loads and Effects

For the design of bearings and expansion joints on the New Harbor Bridge, the additional combined movements due to creep, shrinkage, and elastic shortening combined with temperature movements shall be considered as follows:

a) 1.2 x (Temperature fall + creep + shrinkage + elastic shortening); and

b) 1.2 x (Temperature rise).

A positive and negative temperature gradient shall be used for the New Harbor Bridge superstructure design including transverse thermal effects. A -10^0F and a $+20^0$F differential temperature shall be assumed between the stay cables and the superstructure. A $\pm 10^0$F differential temperature shall be assumed between opposite faces of towers.

13.2.1.9 Vessel Collision

Vessel collision forces shall be analyzed in accordance to the current AASHTO *Guide Specifications and Commentary for Vessel Collision Design of Highway Bridges*. The operational classification of the New Harbor Bridge shall be "critical" or "essential."

Developer shall survey current and future vessel sizes and operating speeds in the Corpus Christi Ship Channel. This information shall be submitted to TxDOT for approval as part of a Vessel Study Report for the New Harbor Bridge. The Vessel Study Report shall define the vessel type, vessel traffic density, and design velocity for design of the New Harbor Bridge. The Vessel Study Report shall be signed and sealed by a Registered Professional Engineer.

13.2.1.10 Concrete Design

The concrete design compressive strength shall not exceed 10,000 psi in prestressed and precast Elements. For prestressed concrete members, the design compressive strength shall not exceed 6,000 psi at release.

Minimum concrete cover for reinforcing steel shall be as specified in Article 5.12.3 of AASHTO *LRFD Bridge Design Specifications* and the following:

a) Modifications for W/C ratio shall not be less than 1.0;

b) Minimum cover for the bottom of deck slabs shall be 1.25 inches;

c) Minimum cover for the top of deck slabs shall be 2.5 inches for bridges without a wearing surface;

d) Minimum cover for the top of deck slabs shall be 2 inches neglecting the wearing surface for bridges with a wearing surface;

e) Minimum cover for the New Harbor Bridge substructures, towers, and foundations shall be 3 inches;;

f) Minimum cover for footings shall be 3 inches; and

g) Interior situation shall not apply.

All reinforcing steel located entirely in the deck and bridge railings of the New Harbor Bridge shall be epoxy coated.

For towers and foundation Elements that support towers of the New Harbor Bridge, in the splash zone, all surface reinforcing steel and vertical reinforcing steel within 1 foot of the Element's surface shall be epoxy coated. The splash zone shall be defined as all surfaces bounded from an elevation 5 feet below the mean high water elevation to 12 feet above the mean high water elevation.

The use of different types of reinforcing steel shall only be allowed where provisions for preventing corrosion due to mixing dissimilar metals have been incorporated into the Project. Dissimilar metals shall not be in contact with each other.

13.2.1.11 Steel Design

All system-redundant-members shall be designed and fabricated to the requirements for fracture critical members. System-redundant-members and their fabrication requirements shall be identified in the Design Documents.

Structural steel shall be limited to ASTM A709 Grade 50, Grade HPS 50, Grade HPS 70, and Grade HPS 100. Weathering steel is prohibited. Grade 36 steel may be used for secondary members only.

13.2.1.12 Decks and Superstructures

The minimum deck thickness shall be 8.5 inches.

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

The New Harbor Bridge shall only have expansion joints at its ends. No expansion joints shall be allowed over the length of the New Harbor Bridge.

If site or construction requirements dictate the need for field splices in modular bridge joint systems, locate splices in areas outside of traffic lanes. Aluminum components are prohibited for modular bridge joint systems.

Developer shall not design bridges with intermediate hinges.

The live load deflection between transverse points of support for the New Harbor Bridge shall not exceed “S”/375, where “S” is the effective distance between transverse points of support.

The New Harbor Bridge shall be designed to avoid pedestrian discomfort from the effects of vehicle loading, synchronized pedestrian loading, and wind loading. The maximum vertical and horizontal acceleration of the superstructure shall be limited to 0.05g for pedestrian and vehicular loading and 0.025g for pedestrian and vehicular loading occurring simultaneously with 30 mph wind at deck level.

The New Harbor Bridge shall be designed with a separate wearing surface. The wearing surface shall not be included when computing composite section properties.

Segmental bridges shall additionally conform to the following:

a) The deck shall be designed with a separate wearing surface that can be removed and replaced without reducing the bridges structural integrity and changing the surface profile.

b) All expansion joints shall be sealed or drained;

c) All internal and external tendons shall be protected with a water-tight duct jointing system;

d) The design, detail and construction shall include deviator blocks or similar anchoring options for the addition of supplemental post-tensioning; and

Wearing surfaces shall be a minimum of 1.5 inches thick.

Closure pours shall be constructed with concrete. High-strength, non-shrink grout may be used as a leveling material and shall conform to the following:

a) Thickness of grout shall not exceed 3 inches;

b) Grout shall contain no calcium chloride or admixture containing calcium chloride;

c) Grout shall meet a minimum of 3,000 psi compressive strength at 24 hours and 5,000 psi compressive strength at seven days in accordance with AASHTO T 106;

d) Grout compressive strength at 28 days shall be no less than the compressive strength for the elements bonded to;

e) Aggregate used to extend the grout shall be supplied by the grout manufacturer;

f) Calcareous aggregate shall not be used;

g) Extended grout/aggregate mixes shall meet these specified strength requirements.

h) Grout shall meet all requirements of AASHTO T 160 except that Developer supplied cube molds shall remain intact with a top firmly attached throughout the curing period. Samples shall have no expansion after seven days and a one-hour compressive strength of 500 psi;

i) Shrinkage shall be 0.0% as measured in accordance with ASTM C 827; and

j) Non-shrink properties shall not be based on gas or gypsum expansion.

Bridge railing shall be designed and constructed in conformance with the requirements of the TxDOT *Bridge Railing Manual*. Bridge railing separating the travel way from a plane of stay cables shall have a minimum rating of TL-5 as per either FHWA NCHRP 350 or MASH.

13.2.1.13 Stay Cable System

Stay cables shall be provided and tested in accordance with the PTI Guide Specification, *Recommendations for Stay Cable Design, Testing and Installation*. Stay cables shall not be grouted in the final condition.

HDPE cable pipe shall be co-extruded with a white colored outer layer. The outer layer shall have an ultraviolet resistance equivalent to black pipe produced with not less than 2 percent carbon black. The interior layer shall be black, weather resistant, and contain not less than 2 percent carbon black. The co-extruded layer shall be fully bonded and the outer layer shall be a minimum of 1/16-inch thick.

Grade 270 weldless low relaxation strand conforming to the requirements of ASTM A416 shall be used for stay cables. Stay cable strand shall be coated and filled with corrosion-inhibiting material and encased in either a HDPE or HDPP sheath using an anchorage system specifically designed for this greased and sheathed strand system.

The stay cable system shall allow control of the tension of individual strands and future strand replacement. The system shall provide independency for the strands regarding anchoring, corrosion protection, installation, tensioning, and replacement.

Stay cable anchorage connections shall be detailed to shed water and sealed to prevent water and moisture intrusion. Stay cable anchorage connections shall be designed to allow full access for inspection, repair and replacement if necessary.

A vandal resistant guide pipe shall be provided from the lower anchorage to a vertical height of 20 feet above the top of the deck surface. In addition, a supplemental waterproof protection system shall be provided near deck level to prevent rain and other deleterious substances from coming into contact with stay cables and with the stay cable end anchorage. Such protection shall extend from the lower anchorage to the top of the guide pipe. The vandal-resistant guide pipe may be part of the supplemental waterproof protection system. Both the guide pipe and waterproof protection system shall include provisions for removal and replacement to facilitate inspection.

The stay cable system shall include a continuous acoustic monitoring system installed by Developer that monitors all tendons within each stay cable. The monitoring period shall begin from the tensioning of the stays through the O&M Period. At a minimum, the system shall be capable of the following:

a) Detecting failures of individual wires within the full length of all stay cables, both during construction and during operation;

b) Providing alerts to the Maintenance Contractor and TxDOT upon detection of a wire failure;

c) Displaying wire failure events on a secure client website;

d) Operating for a minimum twenty-five year service life with regular maintenance; and

e) Maintaining a minimum ninety five percent uptime throughout its service life.

The acoustic monitoring system supplier shall provide verification of their ability to monitor stay cable structures. The supplier shall provide documentation demonstrating a minimum of five monitoring years of experience for stay cable structures for the purpose of detecting wire failures within the stay cables. The supplier shall provide the monitoring and maintenance services, including:

a) Annual maintenance and testing site visits;

b) Experienced data analysts to review recorded events within three business days;

c) Quarterly reports displaying wire failure locations and times, as well as system uptime;

d) Offsite monitoring of the system to ensure operation;

e) Remedial maintenance to correct any detected operational issues; and

f) Offsite storage of backup data.

13.2.1.14 Foundations

Foundations shall be designed using either LRFD or ASD procedures. Foundation verification methods shall be limited to those covered in the current AASHTO *LRFD Bridge Design Specifications* or TxDOT *Geotechnical Manual*.

For drilled shafts, Developer shall perform integrity testing consisting of crosshole sonic logging and gamma-gamma logging, or thermal integrity profiling on 100 percent of drilled shaft bridge foundations.

For driven piling, the Pile Driving Analyzer (PDA) system shall be used to determine if each hammer is delivering the energy required determined by a WEAP analysis. The Case Pile Wave Analysis Program shall be used to determine the as-built pile capacity from PDA data. As a minimum, the first pile driven for each substructure unit shall be a PDA test pile.

Spread footing and post-grouted drilled shaft foundations are not allowed. Steel piling is not allowed for the New Harbor Bridge.

Mechanically Stabilized Earth (MSE) walls shall not serve as structural foundations for bridges and shall not be subjected to vertical loads from the bridges.

Bridge approach slabs shall be designed and constructed to mitigate settlement immediately behind abutment backwalls.

13.2.1.15 Substructures

Substructures and bridge embankments on the right side of the travel way shall be located outside the clear zone where feasible with TxDOT provided ROW. If TxDOT provided ROW does not allow for placement of substructures and bridge embankments on the right side of the travel way outside the clear zone, Developer shall maximize the horizontal clearance at structures.

Integral abutments, where the superstructure is structurally framed (either completely or partially) into the abutment, shall not be permitted.

Except as noted, two column substructures are prohibited for grade separations over roadways. Two column straddle bents may be used for flyover, direct connect bridges.

Lateral clearance to railroad tracks shall be in accordance to the standards of the track owner.

13.2.1.16 Towers

Towers, including foundation Elements, shall not be located between the bulkhead lines as depicted in Attachment 13-2, New Harbor Bridge Clearance Requirements.

If the existing mooring structure on the south side of the Corpus Christi Ship Channel is removed, Developer shall relocate it. Developer shall coordinate the location of the mooring structure with the Port of Corpus Christi. The mooring structure shall be placed at a location which accommodates the New Harbor Bridge tower and Port of Corpus Christi operations. TxDOT shall approve the new location of the mooring structure. Details of the existing mooring structure will be provided by TxDOT.

Towers constructed in the Corpus Christi Ship Channel shall be protected by a fender system. Fender systems shall be designed in accordance to the AASHTO *Guide Specifications and Commentary for Vessel Collision Design of Highway Bridges*. Fender systems shall not be located between the bulkhead lines as depicted in Attachment 13-2.

As an alternate to a fender system, Developer may design and construct a dock around towers of the New Harbor Bridge that are constructed in the Corpus Christi Ship Channel. Docks shall be designed in accordance with the current Port of Corpus Christi Authority *Project Manual*. A minimum of 5 feet of scour shall be included in the design of docks.

13.2.1.17 Utilities and Appurtenances

Only Utilities and appurtenances that serve the New Harbor Bridge or highway facilities may be attached to structures.

Conduit and drainage pipe shall not be cast into bridge decks. Conduit and drainage pipe located below bridge decks shall be located above the low member elevation and between the fascia Elements such that they are not visible from an elevation perspective.

Developer shall design a drainage system to meet the requirements of Section 12. The maximum bend in the drainage pipe shall be 45 degrees. The sum of all bends in a continuous segment of drainage pipe shall not exceed 180 degrees with adjacent cleanout access required per every cumulative 90 degree bend.

Drainage pipe shall not be routed internally or embedded within piers or towers. Drainage pipe shall be recessed in the exterior face of pier columns and towers using pier relief details. The design shall allow for inspection and replacement of drainage pipe.

Developer shall provide and install all permanent and temporary navigation lighting required by the USCG and FAA during construction. The systems shall be suitable for a marine environment. All housings shall be constructed of non-corrosive material and mounting brackets shall be hot-dip galvanized steel with stainless steel hardware complete with all required accessories. Galvanized steel shall be galvanized in accordance with ASTM A123 with a coating thickness grade of 100.

Developer shall provide a UL master labeled lightning protection system. The installation shall comply with NFPA 780 and UL 96. UFER grounds shall not be used as the sole grounding system. The lightning protection system shall be designed to allow for connection to the future closed circuit cameras without modification to structural Elements. All connections and components of the system shall be accessible for inspection and maintenance and not accessible to the general public.

13.2.1.18 Closed Circuit Cameras

Developer shall design the New Harbor Bridge allowing for future installation of closed circuit cameras. Conduit, pull boxes, mounting brackets and all ancillaries necessary to operate the closed circuit cameras

shall be installed by Developer. The design of the New Harbor Bridge shall not necessitate welding for the future installation. Mild and prestressed reinforcing steel shall be located to accommodate the future installation. Details for the closed circuit cameras will be provided by TxDOT.

Developer shall submit a conceptual camera installation plan to TxDOT showing the installation of the future closed circuit cameras. The conceptual camera installation plan shall provide the same level of details required for a Released for Construction Document and shall be signed and sealed by a Registered Professional Engineer. The conceptual camera installation plan shall be subject to TxDOT Approval.

13.2.1.19 Maintenance and Inspection

Developer shall make bridge superstructures, joints, and bearings accessible for long-term inspection and maintenance. Allowable access systems are permanent walkways, permanent ladders and under-bridge inspection vehicles. Additionally, a permanent, self-propelled, variable speed, controller driven maintenance traveler may be installed to access New Harbor Bridge superstructure Elements.

All New Harbor Bridge superstructure Elements at or below deck level, the top of all edge girders, and stay cable anchorages at deck level shall be made accessible for a hands-on inspection. Hands-on inspection shall be as defined in 23 CFR 650.305. Developer shall submit an inspection plan graphically depicting how each superstructure Element at or below deck level is accessible for a hands-on inspection.

Developer shall install bird and varmint deterrent measures on the New Harbor Bridge, box girder superstructures, and hollow substructure Elements. Bird deterrent measures shall also be installed on fender systems.

Box girder superstructures, hollow substructure Elements, and hollow towers shall be designed to allow for positive air flow inside the Element. Access openings that allow the free flow of air shall be provided between each cell of box girder superstructures.

Box girder superstructures, hollow substructure Elements, and hollow towers shall be accessible without impacting traffic below. The minimum inside depth shall be 6 foot and the minimum access opening shall be 3 foot diameter. At cross frame, stiffener, and similar locations, the inside depth may be decreased but shall not be less than 3 foot. Developer shall install locked entryways with hatches that hinge to the inside for all points of access. Weatherproof access openings shall be provided at the ends of substructure cap beams and shall be located on the bottom flange of box girder superstructures.

Developer shall install an 110V and 220V electrical system with lighting and power outlets inside box girder superstructures and towers. Illumination shall be a minimum of 200 lux. Electrical outlets shall be provided at 50-foot intervals and within 10 feet of all major inspection or maintenance locations and in accordance with Section 16.

13.2.1.19.1 <u>Access Systems</u>

Permanent access systems shall be located above the low member elevation and between the fascia Elements such that they are not visible from an elevation perspective, except as noted. Maintenance travelers may project below the low member elevation of the New Harbor Bridge.

Access systems shall have enough workspace for three individuals. Temporary access systems shall have a minimum 700 pound capacity. Permanent access systems shall have a minimum 1,500 pound capacity. Access systems shall provide a minimum vertical clearance of 6 feet at all locations of the superstructure.

Access to superstructure Elements from maintenance travelers shall be provided by the systems mechanical and electrical components. Maintenance travelers shall only be located on continuous superstructure sections. If the New Harbor Bridge is constructed with separate superstructures, one for each the northbound and southbound lanes of US 181, a single maintenance traveler is prohibited.

At a minimum, access to permanent maintenance travelers shall be provided at the ends of each span of the New Harbor Bridge. If separate maintenance travelers are provided for each span, access to adjacent travelers shall be provided at the spans ends.

Developer shall provide permanent means to access maintenance travelers. Primary access shall not require the use of rigging. Developer shall provide multiple connection points to facilitate rigging as a back-up access system.

Developer shall provide means to secure access systems from the general public.

The connection of maintenance travelers to the New Harbor Bridge shall be redundant. Maintenance travelers shall ride on an independent system and not on bridge edge girders.

Maintenance travelers shall be stored outside the vertical clearance envelope and adjacent to a tower or substructure unit. When stored, maintenance travelers shall be secured from moving and have accommodations for securing loose and moveable elements.

Permanent access systems shall not be used to construct the New Harbor Bridge.

13.2.1.19.2 Maintenance and Inspection Manual

Developer shall provide a Maintenance and Inspection Manual for the New Harbor Bridge. The manual shall be written in continuous narrative form and not fragmented sections prepared by individual equipment manufacturers. The manual shall provide suggested guidelines and procedures for inspecting and maintaining the bridge. At a minimum, the manual shall cover the following items as applicable:

a) Box girders and caps (substructures);

b) Towers;

c) Bearings including replacement procedures;

d) Expansion joints including replacement procedures;

e) Post-tensioning systems;

f) Stay cable systems including force adjustment and replacement procedures;

g) Stay cable vibration suppression systems including replacement procedures;

h) Mechanical and electrical systems;

i) Lightning protection systems;

j) Bridge lighting systems;

k) Vermin protection/deterrent systems;

l) Settlement monitoring procedures;

m) Permanent inspection equipment;

n) Deck rehabilitation procedures;

o) Structural steel protection systems; and

p) Drainage systems.

The manual shall include published literature, detailed shop drawings, and as-built documents necessary to communicate maintenance issues and orientate maintenance and inspection personnel. The manual shall address the exact equipment provided and shall not contain marked-up general catalog data. Complete nomenclature of all replaceable parts, their part numbers, and the name and address of the

nearest vendor shall be included. Copies of all guarantees and warranties issued for system components shall be provided.

The manual shall identify all system-redundant-members including a summary of the assumptions and analyses performed to verify system redundancy.

The manual shall be provided bound and electronically. The manual shall be accessible using a laptop computer or tablet

13.2.1.20 Bridge Information Model (BrIM)

Developer shall prepare and submit a BrIM model of the New Harbor Bridge. The BrIM model shall be a single, 3-D MicroStation file that includes the initial design details and shall be updated to include as-built conditions. At a minimum, the BrIM model shall include aerial photography, topography, utilities, and appurtenances, and be produced to a minimum of LOD 200. The BrIM model shall incorporate and host a geospatial digital photographic documentation record of the as-built New Harbor Bridge. At a minimum, all photographic images shall include the following:

a) Date;

b) Time:

c) Location;

d) Orientation; and

e) Description.

The BrIM model shall include a georeferenced database that is spatially linked based on common attributes illustrating all Elements used to construct the New Harbor Bridge. At a minimum, the database shall include the following:

a) Line items for each Element listed in the current AASHTO *Guide Manual for Bridge Element Inspection*:

b) A unique reference identifier to identify all New Harbor Bridge Elements;

c) Relevant groupings, sub-groupings, or sets to which an Element belongs;

d) A general description of the Element;

e) Specifications, ratings, and/or maintenance records associated with the Element;

f) Manufacturer, facility, and batch number of Element;

g) Date and time of installation of Element;

h) Coatings and finishes;

i) Mill certificates; and

j) Records of remedial actions.

The BrIM model shall be used to document Developer's maintenance obligations as specified in Section 19.

13.2.1.21 Load Rating

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

Each separate bridge superstructure Element constructed or modified under the Project shall be rated. At a minimum, ratings shall be computed for moment and shear at the one-tenth points of each bridge span.

HL-93 and permit design loads shall be used in the models to generated load rating results.

For the New Harbor Bridge, a three-dimensional load rating model shall be constructed using shell or grillage elements. The true horizontal and vertical alignment of the superstructure and the locations of substructure Elements shall be included in the model. The load rating models shall consider effects of construction staging.

The model shall be capable of distributing loads based on the geometry and stiffness of the structural Elements. Nonstructural Elements, such as bridge railing, shall not be modeled as load-carrying Elements. The distribution of loads shall be the same as that used in the design of the structure.

Load rating results for the New Harbor Bridge shall be submitted to TxDOT in a Bridge Load Rating Report. The report shall include detailed directions and methods to load rate the bridge in the future. The load rating analysis computer model electronic files shall be provided as an attachment The Bridge Load Rating Report shall be signed and sealed by a Registered Professional Engineer.

13.2.2 Retaining Walls

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

Wall types and Elements will be allowed only if:

a) They have been accepted for general use by FHWA, and

b) Developer can demonstrate that the design of the wall type and Elements shall meet the functional requirements of the Project.

Except as noted, metal walls (including bin walls and sheet pile walls), recycled material walls and timber walls are not allowed. Steel sheet pile walls are allowed for docks in the Corpus Christi Ship Channel. Steel sheet pile walls shall be designed assuming a sheet pile thickness at the end of a 75-year service life. The corrosion rate shall be determined by a corrosion specialist. The corrosion specialist shall have experience determining corrosion rates for steel Elements in a marine environment on a minimum of five projects.

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

The design of wall structures shall take into account live load surcharges. Developer shall apply the appropriate live loading condition that each wall is subjected to. These live load surcharges shall be based on the latest AASHTO *LRFD Bridge Design Specifications*, American Railway Engineering and Maintenance of Way Association (AREMA) specifications, or the requirements of the specific railroad and transit owner/operator, as appropriate.

Structural integrity of retaining walls shall be inspected and monitored in accordance with Good Industry Practice. Tolerances and mitigation measures shall be in accordance with the Maintenance Management Plan and Good Industry Practice.

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

Weep holes are only allowed at the base of walls.

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

Developer shall consider the construction and placement of reinforcing strips and wall panels when storm sewers, inlets and other obstructions are located within the reinforced mass of an MSE retaining wall.

Inlet length shall be limited to five feet when placed at the top of the MSE wall. Storm sewer lines shall not be placed parallel to the MSE wall immediately behind the MSE wall panels. Developer shall provide reinforcement guidance to the fabricator for any obstructions longer than five feet behind an MSE wall.

13.2.3 Noise Walls

Developer shall design and construct noise walls to achieve the decibel reduction requirement in the NEPA Approval(s) and the aesthetic requirements in Section 15.

Noise walls shall be designed in accordance with Article 15.8.4 of the *AASHTO LRFD Bridge Design Specifications*.

Timber noise walls are not allowed.

13.2.4 Drainage Structures

Developer shall account for maximum anticipated loadings.

Energy dissipaters shall be considered as structural Elements.

Developer shall analyze existing drainage structures for capacity to accommodate any additional loads, surcharge, settlement, and other structural impacts associated with the Project.

Developer shall inspect existing bridge class drainage structures in accordance *with AASHTO Manual for Bridge Evaluation* and *TxDOT Bridge Inspection Manual*.

For drainage structures that are to be reused or widened, Developer shall perform video inspections and submit the video to TxDOT. Developer shall analyze those structures and shall include recommendations for rehabilitation and replacement efforts as needed to accommodate the Project. These analyses and subsequent recommendations shall be subject to TxDOT Approval.

If pipe culverts are to extend through the retaining walls or noise walls, the pipe shall be installed so that no joints are located within or under the wall.

13.2.5 Sign, Illumination, and Traffic Signal Supports

For bridges and walls longer than ½ mile, Developer shall provide sign supports at ½ half-mile intervals. For bridges and walls longer than 500 feet and shorter than ½ mile, Developer shall provide sign supports at 500-foot intervals. The sign supports shall accommodate sign areas up to and including 16 square feet. Cantilever and sign bridge supports shall be placed outside the clear zone or shall be otherwise protected by appropriate safety measures.

13.3 Construction Requirements

13.3.1 Erection

Steel erection shall be in accordance with AASHTO/NSBA Steel Collaboration S10.1 *Steel Bridge Erection Guide Specifications*. Developer shall not erect Elements over an open highway or other open travel way. Developer shall stabilize all Elements before allowing traffic to travel under erected Elements.

For the New Harbor Bridge, Developer shall develop an Erection Manual that includes complete detailed erection sequence drawings, erection stresses in permanent and temporary members, bent and falsework reactions determined for each construction stage, and moments, shears, axial loads and other forces computed and tabulated for the towers and superstructure of the New Harbor Bridge at a sufficient number of points to demonstrate stability is maintained throughout the erection operations and the load demand will not exceed the capacity and allowable stresses for erection and service conditions. Developer shall include step-by-step erection procedures with complete details of stay-cable erection and monitoring of stressing operations. Details of contemplated elevations, cable lengths, adjustments, and shims required

shall be shown for each erection stage. Surveying and monitoring to be implemented for geometry control shall be specified.

The Erection Manual shall be prepared by a Registered Professional Engineer specializing in complex bridge erection, evidenced by knowledge, training, and experience in erection for bridges of similar scope and complexity as the New Harbor Bridge. The Erection Manual shall be submitted to TxDOT and is subject to TxDOT Approval.

For all other bridges except those with precast concrete beam superstructures, Developer shall develop erection drawings to demonstrate stability is maintained throughout the erection operations and the load demand will not exceed the capacity and allowable stresses for erection and service conditions. At a minimum, the erection drawings shall include the following:

a) Plan of the work area showing structure location relative to supports and all obstructions;

b) Equipment to be used including allowable load information;

c) Erection sequence for all pieces;

d) Member weights and center of gravity location of pieces to be lifted;

e) Locations of cranes, holding cranes, and temporary supports (falsework), including when to release load from temporary supports and holding cranes;

f) Details of falsework including specific bracing requirements with maximum allowable design wind speed clearly indicated;

g) Girder lifting points;

h) Diaphragm and bracing requirements; and

i) Minimum connection requirements.

The Lead Roadway Bridge Design Engineer shall review the erection drawings and certify that the procedures specified will not cause permanent damage and that stability is maintained throughout the erection operations. The erection drawings and Lead Roadway Bridge Design Engineer's certification shall be submitted to TxDOT.

13.3.2 Bridge Demolition

Developer shall demolish and remove the entire Existing Harbor Bridge and appurtenances. Developer is solely responsible for all aspects of safety, structural capacity, structural stability, applicable regulations, and permits associated with demolition Work.

Demolition shall include all existing superstructure Elements and all substructure Elements to a minimum of two feet below final grade elevation unless directed otherwise by permitting agencies.

Explosives may be used to control demolition of the Existing Harbor Bridge. Removal operations that use explosives to drop portions of the Existing Harbor Bridge into the Corpus Christi Ship Channel are prohibited.

Except as noted, Developer shall prevent all debris from falling into or otherwise being deposited into the Corpus Christi Ship Channel. Debris caused from removal of the piers immediately adjacent to the Corpus Christi Ship Channel may fall into the channel. Side-scan sonar surveys shall be performed before and after all demolition Work to determine if any debris has fallen or been deposited in the Corpus Christi Ship Channel. Developer shall remove all debris created by demolition as identified in the surveys.

A demolition and removal plan, signed and sealed by a Registered Professional Engineer, shall be submitted to TxDOT and applicable Governmental Entities for approval. The demolition and removal plan shall be consistent with the Corpus Christi Ship Channel Plan required in Section 2 and shall show

the locations of equipment used for demolition, sequence of removal, loading limits, allowable location of loads, equipment specifications including their weight, and all other material that will be placed on the structure during or prior to demolition. The demolition and removal plan shall include plans for all falsework necessary for demolition prepared in accordance to Item 420.4.2 of Attachment 13-1, Structure Provisions.

13.3.3 Stay Cable Stressing

Jacks and gauges for cable installation shall be match-calibrated using a load cell or calibrated static load machine by an independent laboratory within one month prior to the beginning of the cable installation, and every six months thereafter, for the duration of cable installation. Calibration shall be accomplished with the jack actively applying load to the machine, not the machine applying load to the jack. Prior to use after each calibration, each field gauge shall be calibrated against the master gauge for reference purposes. Any internal work performed on the jack shall require recalibration.

The detailed cable installation and stressing procedures, contained as part of the Erection Manual, shall prescribe force, cable elongation, and deck elevations for each jacking operation, and shall establish the priority of force or geometry for control of the jacking operation. This procedure shall stipulate the permissible variance between force and elongation and deck elevation for each cable to be installed.

The cable stressing procedures shall include detailed provisions for monitoring the installation of each cable.

Permanent stay cable installation records shall be established and provided by Developer for each cable installation. Such records shall include survey records; date, time, and ambient temperatures; cable forces; cable elongation measurements; ring nut setting; deck loading conditions; and all other special notations necessary and sufficient to establish the conditions under which the cable was installed. These records shall include the as-built elevations of the deck along the centerline of the anchoring Element atop each stay cable anchor block for the length of the bridge immediately prior to and immediately after each stressing operation. Copies of this data shall be provided by Developer to TxDOT within 24 hours of completing each cable stressing operation.

13.3.4 Structure Metals

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

13.3.5 Waterproofing

Developer shall apply epoxy waterproofing on top of bent caps, abutment caps and abutment backwalls.

13.3.6 Concrete Mix Design

All concrete bridge Elements shall be constructed using high performance concrete. High performance concrete shall be defined as Elements constructed with one of the mix design Options 1-5 in accordance to Item 421 of Attachment 13-1, Structure Provisions.

Lightweight concrete is prohibited. Self-consolidating concrete is only allowed for casting precast concrete Elements in accordance to Item 421 of Attachment 13-1, Structure Provisions.

13.3.7 Concrete Finishes

All concrete surfaces that do not have aesthetic treatments shall have a uniform texture and appearance. Color treatment, where required as an aspect of the aesthetic treatment of the concrete, shall be uniform in appearance. Ordinary Surface Finish as defined in Item 420 of Attachment 13-1, Structure Provisions, shall be applied to the following as a minimum:

a) Inside and top of inlets;

b) Inside and top of manholes;

c) Inside of sewer appurtenances;

d) Inside of culvert barrels;

e) Bottom of bridge slabs between girders or beams; and

f) Vertical and bottom of surfaces of interior concrete beams or girders.

13.3.8 Steel Finishes

Structural steel Elements and permanent access systems shall receive a zinc metalized or galvanized finish. A compatible sealer and an aesthetic top coat shall be applied over the metalized or galvanized finish. Developer shall provide documentation on the compatibility of the products used to achieve the steel finish. The aesthetic top coat shall provide UV protection and shall be supplied with manufacturer's recommendations for repairing, removing, and over-coating the coating without damaging the underlying metallizing or galvanizing.

The color of the structural steel finish shall conform to the aesthetic scheme of the Project.

13.3.9 Temporary Works

Temporary works used to construct the New Harbor Bridge shall not be located between the bulkhead lines as depicted in Attachment 13-2, New Harbor Bridge Clearance Requirements.

13.4 Deliverables

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats are Microsoft Word, Microsoft Excel, or Adobe Acrobat (PDF) files, unless otherwise indicated. Drawings shall be submitted electronically in original MicroStation format and in Adobe Acrobat (PDF). The following list should not be considered all-inclusive and the Technical Provisions should be reviewed for any other structural deliverable items. All deliverables shall conform to the standards required in the Project Management Plan.

Deliverable	Number of Copies		Submittal Schedule	Reference Section
	Hardcopy	Electronic		
Corridor Structure Type Study and Report	4	1	Prior to design of corresponding Elements	13.1
Corrosion Protection Plan	4	1	Prior to submittal of corresponding Elements RFC Document	13.2.1.2
Redundancy Report	6	1	No later than submittal of corresponding New Harbor Bridge superstructure RFC Document	13.2.1.3
Climatology and Wind Report	4	1	Approval prior to submittal of the Sectional Model Testing Report	13.2.1.7.1
Sectional Model Testing Report	4	1	Approval prior to submittal of the Wind Engineering Report	13.2.1.7.2
Wind Engineering Report	4	1	Approval prior to Approval of New Harbor Bridge superstructure RFC documents	13.2.1.7.3
Vessel Study Report	4	1	Approval prior to Approval of New Harbor Bridge RFC documents	13.2.1.9
Conceptual camera installation plan	8	1	No later than submittal of corresponding Elements RFC Document	13.2.1.18
Inspection plan	4	1	No later than submittal of New Harbor Bridge superstructure RFC Documents	13.2.1.19
Maintenance and Inspection Manual	6	1	Prior to Substantial Completion	13.2.1.19.2
BrIM model	N/A	1	Prior to Substantial Completion and updated at the end of the O&M Period	13.2.1.20
Bridge Load Rating Report	4	1	Four weeks prior to corresponding bridge	13.2.1.21

Deliverable	Number of Copies		Submittal Schedule	Reference Section
	Hardcopy	Electronic		
			opening to traffic	
Video inspections	N/A	1	Prior to submittal of corresponding Elements RFC Document	13.2.4
Erection Manual	4	1	Prior to submittal of corresponding Elements RFC Document	13.3.1
Demolition and removal plan	8	1	60 days prior to demolition of the Existing Harbor Bridge or as required by permitting agencies, whichever is greater	13.3.2
Steel Finish Compatibility Documentation	4	1	30 days prior to application of steel finish	13.3.8

14 RAIL

14.1 General Requirements

This section sets forth the criteria for Work impacting existing railroad ROW.

14.2 Projects Impacting Railroad ROW

Developer shall coordinate with the railroads and all applicable Governmental Entities in the development of the Project.

14.3 Railroad Agreements

Developer shall obtain all Approvals, permits and agreements, including any associated fees as required prior to any Work impacting each railroad being performed. Construction and maintenance agreements shall be between TxDOT, Developer, the appropriate railroad company and appropriate Governmental Entities and may take twelve (12) months or more to obtain from each railroad company. Right of entry agreements, as required, shall be between the appropriate railroad and the Developer. Developer is responsible for developing and processing these agreements, including any associated fees. Current approved templates for TxDOT/railroad company agreements are available from the TxDOT Rail Division at Rail-Highway.Section@txdot.gov.

The following agreements may be required based upon each railroad's requirements:

a) Preliminary Engineering Agreement – Class 1 railroads may require preliminary engineering agreements in order to proceed with the development and review of plans. This agreement authorizes reimbursement to the railroad company for preliminary engineering and estimating performed by the railroad or their consultant(s). Developer shall prepare the template agreement and shall be responsible for authorized reimbursements to the railroad.

b) License to Cross and construction and maintenance agreement – Developer shall prepare template agreement, including all required exhibits, to be executed between railroad, Developer and TxDOT. A License to Cross railroad right of way is normally required when the highway project involves a new crossing, utility crossing, or grade separation of the railroad. A separate easement agreement may be obtained in lieu of the License to Cross. Developer shall prepare all the documents required to obtain each License to Cross and construction and maintenance agreement, including preparation of the plans and specifications and estimates, making necessary modifications as required on behalf of TxDOT. If the railroad(s) requires a metes and bounds survey to accompany the construction and maintenance agreement, Developer shall be responsible for this survey. Developer shall submit the draft License to Cross and construction and maintenance agreement to TxDOT for transmittal to each railroad. After all comments have been incorporated or satisfactorily resolved by either Developer, railroad(s), or TxDOT, Developer shall submit a complete and final agreement, including any associated fees to TxDOT for execution. This agreement shall include provisions for each party's access to the facilities for regular inspection and maintenance as well as emergency repairs as required.

c) Aerial Agreements (for grade separations only) - Developer may be required by the railroad company to enter into a separate agreement to obtain air rights to cross railroad ROW. If an aerial agreement is required, the "License" portion of the construction and maintenance agreement will be modified to identify the aerial agreement as right to cross railroad right of way with the new highway facility.

d) Temporary Construction Easements - Developer shall be responsible to obtain any required temporary construction easements, including any associated cost for the railroad company. This requirement will be stipulated in and be a part of the construction and maintenance agreement.

e) Railroad's Contractor Right-of-Entry Agreements (Texas approved versions only) – In order to enter the railroad's right-of-way to perform the Work, Developer or their contractor shall secure a railroad Right-of-Entry agreement and shall coordinate the arrangements of the necessary agreements directly with the railroad. Developer shall meet all right-of-entry requirements, including railroad liability and insurance requirements, at the sole cost of the Developer.

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

In addition to meeting the requirements in new agreements, Developer shall meet the requirements of existing agreements in place between TxDOT and the affected railroad. Developer shall also assume and execute TxDOT's responsibilities and duties as defined in Section 5 and Attachment 14-2.

14.4 Railroad Design Standards

Developer shall meet the design Approval process requirements between TxDOT and UPRR (The Railroad Agreement). For all railroad Elements not requiring railroad Approval through the process described in the Railroad Agreement, the design shall be based on the most recent American Railway Engineering and Maintenance of Way Association (AREMA) guidelines including but not limited to the *Manual for Railway Engineering* and *Communications & Signal Manual of Recommended Practices* and the requirements of the railroad. Developer's design shall minimize service interruptions to existing rail lines and shall be coordinated with railroads regarding allowable track outages and work windows near existing rail lines.

All Work involving railroad companies, Work on railroad ROW, and the development and execution of railroad programs shall be in accordance with the respective railroad, State and federal Law and the practices, guidelines, procedures and methods contained in the TxDOT *Traffic Operations Manual*, Railroad Operations Volume as amended per Attachment 14-1, *Amendments for TxDOT's Traffic Operations Manual*. Additionally, the requirements of the owner of each facility crossed, including the requirements in the Railroad Agreement, shall be compared to the requirements in Attachment 14-1, and the most restrictive criteria shall be utilized.

For railroad Elements not requiring railroad Approval at highway-rail grade crossings, Developer shall maintain the roadway and drainage design parameters at the crossing with exception to the cross slope of the pavement which may be transitioned to match the grade across the rail line. The structural design of any Utilities, including drainage structures, installed by Developer and crossing a rail line, shall be in accordance with the operating railroad's design criteria. Developer shall coordinate the design, construction and the construction staging, including any temporary track detours (shooflies), with the operating railroad.

14.4.1 Design Criteria

Developer shall meet the design requirements of AREMA and the applicable railroad.

Developer shall design and construct integrated pier protection in locations where the horizontal clearance of roadway structure components from a rail line is less than 25' as required by the railroads.

Freight rail lines shall be designed and constructed using the most current applicable design standards for Class I Railroads and heavy-haul high-axle-load requirements. The horizontal and vertical components of any track to be re-aligned shall be designed and constructed for a design speed in accordance with the

requirements of the applicable railroad within the Project limits. Any deviation from design standards will require an 'accepted with exception' Approval from the railroad.

Developer shall also design and construct railroad maintenance roads that are disturbed as a result of Project construction or along the length of any Class 1 track to be re-aligned within the Project limits in accordance with the requirements of the applicable railroad.

14.5 Administrative Requirements

14.5.1 Project Work Affecting Railroad Operations

Should the Project cross a railroad ROW owned by an operating railroad of a railroad line not described in the Railroad Agreement, Developer shall coordinate the Work with the operating railroad or lessor of that line/property.

Where applicable, the design and installation of all railroad warning devices and traffic signals shall be coordinated with the appropriate Governmental Entities and operating railroads.

No Work shall commence on railroad property without approved right of entry documentation. The Developer shall comply with all railroad safety rules and applicable portions for Code of Federal Regulations 49CFR214 (Railroad Workplace Safety).

14.5.2 Railroad Agreement

In addition to assuming and executing TxDOT's responsibilities and duties as defined in Section 5, Developer shall be responsible for obtaining the required Approvals, permits, and agreements as required for the Work, including any railroad related Work.

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

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

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

14.5.4 Operational Safety

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

14.5.5 Railroad Right of Entry Agreement

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

Developer shall submit executed railroad agreements in their entirety, as part of the Final Design Documents.

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

14.5.6 Insurance Requirements

Developer shall obtain the insurance as required in Exhibit 14 of the Agreement.

14.6 Construction Requirements

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

Developer shall be responsible for scheduling the work to be completed by operating railroad as well as the Work to be completed by its own forces. Developer shall be responsible for all costs associated with the railroad force account work.

14.6.1 Flagging

Developer shall be responsible for any cost and arrange for railroad flagging as required with the railroad company to ensure the safe passage of rail traffic throughout the Project limits effecting railroad right of way.

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

14.6.2 Safety Certification

Developer shall comply with the railroad's requirements for contractor safety training prior to performing Work or other activities on the railroad's right-of-way and shall maintain current registration prior to working on railroad property.

14.7 Port of Corpus Christi Rail Lines

Developer shall comply with the Port of Corpus Christi requirements for any impacts to the Port's rail lines. Developer shall obtain Approval from the Port, when temporarily closing any of their rail lines for construction activities. Developer shall be aware that temporary tracks may need to be designed and constructed if requested by the Port so that the Port may continue with its operations.

14.7.1 Design Criteria

The Port utilizes the UPRR guidelines for design requirements. If needed, the Port will determine if any guidelines need to be deviated.

14.7.2 Flagging

Developer shall be responsible for any cost and arrange for railroad flagging as required with the Port to ensure the safe passage of rail traffic throughout the Project limits without affecting railroad right of way.

Developer shall notify the Port at least ten (10) Business Days in advance of Developer commencing Work and at least thirty (30) Business Days in advance of any Work by Developer in which any person or equipment will be within twenty-five (25) feet of any track or will be near enough to any track that any equipment extension such as, but not limited to, a crane boom will reach to within twenty-five (25) feet of any track. No Work of any kind shall be performed, and no person, equipment, machinery, tool(s),

material(s), vehicle(s), or thing(s) shall be located, operated, placed, or stored within twenty-five (25) feet of any track(s) unless authorized by the port. Upon receipt of such thirty (30)-day notice, the Port will determine and inform Developer whether a flagman need be present and whether Developer needs to implement any special protective or safety measures.

15 AESTHETICS AND LANDSCAPING

15.1 General Requirements

This Section 15 defines requirements with which Developer shall design and construct aesthetic treatments for the roadway, structures, drainage, and landscaping Elements of the Project. Aesthetic treatments shall be designed to harmonize with the local landscape and architecture.

15.2 Administrative Requirements

This Section 15 presents minimum aesthetics and landscape design requirements for Project designs. For purposes of this Section 15, the following list of items will be considered the aesthetics Elements of the Project design:

a) Materials, finish, color, and texture of bridge Elements including the cable-stayed main span bridge, approach bridges and all other corridor bridges;

b) Materials, finish, and color of barriers and railings;

c) Paved slope treatments;

d) Finish, color, and texture of retaining and noise walls;

e) Contour grading, slope rounding, channel treatments, and drainage;

f) Sidewalks, medians and shared-use paths, including material, finish, and color;

g) Fencing;

h) Signage – overhead, attached, and ground-mounted;

i) Light fixtures, including roadway lighting and shared-use path lighting; and

j) Architectural lighting for the cable-stayed bridge and approach bridges.

15.2.1 Aesthetics Concepts

Aesthetic Elements shall be designed as corridor-wide enhancements. To the extent practicable, the aesthetic Elements, where applied, shall remain consistent in form, materials, and design throughout the length of the Project.

15.2.2 Aesthetics and Landscaping Plans

Developer shall prepare Aesthetics and Landscaping Plans in conformance with Attachment 15-1, Aesthetic Guidelines. Developer shall submit the Aesthetics and Landscaping Plans to TxDOT for review and Approval. Approval of the Aesthetics and Landscaping Plans shall be a condition of NTP2. Developer shall use the images provided in Attachment 15-1 as a guide for establishing the Final Design.

Developer shall implement the landscaping and aesthetics for the Project in accordance with Attachment 15-1 and the approved Aesthetics and Landscaping Plans.

The Aesthetics and Landscaping Plans shall be presented in the following quantities and format:

a) 11 inches x 17 inches

b) Three one-sided color hardcopies

c) PDF on three CDs, DVDs, or USB drives

The Aesthetics and Landscaping Plans shall include all Elements to fully communicate the proposed aesthetic treatment of the Project to TxDOT and shall address:

Aesthetics

Developer shall provide:

a) All plans, sections, elevations, perspectives, isometrics, and other graphics or text, as needed, to fully communicate the proposed aesthetic Elements;

b) Drawings showing locations of proposed site-specific Elements (e.g., fences, signage, bridge enhancements, architectural lighting, roadway lighting, and landscaping);

c) Drawings showing the location of existing and proposed Utilities as they relate to the location of aesthetic improvements, including composite drawings showing potential conflicts for proposed improvements; and

d) Drawings showing proposed color schemes.

Landscaping (Planting and Irrigation):

a) A plan indicating plant types and locations, maximum planting slopes, and planting dates;

b) Irrigation plan;

c) A maintenance program; and

d) Composite drawings of all utilities and easements that would interfere with landscaping markers, or any other identified enhancements.

The Aesthetic and Landscaping Plans shall include all plans, elevations, perspectives, isometrics, and other formats as needed to fully convey the aesthetic treatment.

The Aesthetics and Landscaping Plans shall be incorporated into the Final Design Documents.

TxDOT Approval of the Aesthetics and Landscape Plans is required prior to construction of any elements affected by the plan.

15.2.3 3-D Computer-Generated Visualizations

Developer shall provide visualizations that accurately depict color palette, textures, and materials. These shall include the following:

Daytime and nighttime visualizations of the New Harbor Bridge including views:

a) from Whataburger Field – right field to the north
b) from the north approach of the existing Harbor Bridge to the west
c) from the Port, at water's edge directly south of the unnamed street to west of Texaco Street with view to the southeast
d) from the driver's perspective approaching from the southwest to the New Harbor Bridge viewing to the northeast on I-281
e) from the shared-use path southwest of the mid-span belvedere viewing to the northeast

Visualizations shall be submitted in the following formats:

a) Uncompressed TIFF (minimum of 40 MB)
b) Compressed JPEG files of all graphics and photos for use in PowerPoint
c) PDF files of all graphics

15.2.4 4-D Animation

Developer shall provide a full-color computer-generated 4-D ("fly-through") animation of the Project corridor as part of the Aesthetic and Landscaping Plan, set in the Project context, depicting the final New Harbor Bridge design from a birds-eye perspective, as viewed from the approach bridges and continuing across the main span bridges and from the Port ground level. The video shall focus on aesthetic treatment and final appearance and shall provide a visual "fly-over" in each directions for the entire corridor such that the aesthetic treatments of the Project are visible. At a minimum, the animation will show the following components:

- Textures and colors
- Aesthetic concepts as provided by Developer
- Form, shapes, and scale
- Ramp conditions
- Landscaping
- Roadway conditions as per the engineered solution
- The Project and Port context (including buildings and bulkhead, for example)

Minimum standards for animation:

- Frame rate = 30 fps
- Resolution = 1280 x 720 screen resolution
- Sound = 1,536 kbps

Files shall be submitted in high-definition Windows Media Video (WMV) format with 5 megabits per second (mbps) bitrate, on CD or data DVD.

15.2.5 Architectural Bridge Model

Developer shall provide a portable physical scale model. The model shall be constructed of durable materials that are sufficiently lightweight and modular to facilitate easy transport. The model shall depict the New Harbor Bridge and the first three piers of the north and south approach bridges, water, and surrounding landform, at a scale between 1:700 and 1:800.The model shall be enclosed in a clear acrylic or Plexiglas case with polished edges and have an integral table-top height pedestal for display purposes. The model case and pedestal base shall be designed and manufactured to be a visually cohesive assembly.

15.2.6 Personnel

Developer shall provide:

a) Landscape Architect, registered in the State of Texas, with a minimum 10 years of experience in designing aesthetics and landscaping Elements for roadway projects of similar scope and complexity, who shall develop the Aesthetics and Landscaping Plan.

b) Bridge Architectural Designer with a minimum of 10 years of experience as a as lead architectural designer, having collaborated with bridge engineers on at least three major bridge projects of comparable scale, prominence, and complexity. Developer shall submit three project examples that convey Bridge Architectural Designer's proficiency and Client reference from each example including: name, title, project role, address, phone number, and email address.

c) Architectural Lighting Designer, who shall be a professional member of the International Association of Lighting Designers and shall have completed of architectural lighting design on at

least two major built bridges and at least two current (additional) projects of comparable scale, prominence and complexity.

15.3 Design Requirements

15.3.1 Aesthetics Principles and Strategies

Developer shall follow the approved Aesthetics and Landscaping Plans, as well as the aesthetics principles, requirements, and strategies established by TxDOT for the Project design, including the following:

a) Aesthetics shall not interfere with safety, constructability, durability, and maintenance requirements.

b) The Project design shall minimize impact to existing trees and to the existing natural environment to the extent possible.

c) The Project design shall emphasize and enhance the existing natural context and landscape to the fullest extent possible.

d) All bridges and bridge Elements shall complement the overall appearance of the New Harbor Bridge.

e) Bridges shall possess an elegant simplicity in which the engineered lines and proportions are the primary design Elements.

f) The approach span architectural Elements shall complement the main span bridge architecture and exhibit well-resolved transitions between bridges, including different depths and types of superstructures and road-width transition points.

g) The designs shall account for the appearance of bridges during both day and night. Architectural lighting of the New Harbor Bridge shall be integrated with roadway and pathway lighting that meets required light levels and is integrated with the overall design vision.

h) Graphics, signage, and lighting shall be consistent along the entire length of the Project.

i) Aesthetic quality of the landscape shall be consistent along the entire length of the Project.

j) Use drought-tolerant native and/or non-invasive naturalized plant materials that thrive with little maintenance.

k) Aesthetic Elements shall be easy to maintain and resistant to vandalism and graffiti.

l) Channel navigational and aeronautical lights shall be selected and placed to meet requirements without detracting from the overall architectural vision of the main span bridge design.

m) Utility and drainage systems shall minimize adverse visual impact and be well integrated into the bridge architecture. Drainage downspouts shall be recessed into towers and pier columns.

n) The shape, pattern, and texture of the MSE wall face relates to the overall architectural vision of the Project

15.3.2 Bridges

All aesthetic treatments for structural Elements shall be coordinated with Developer's structural design team to facilitate constructability and maintain safety requirements. All substructure columns shall be consistent in form and texture, with similar shapes and details used for all bridges, in accordance with Attachment 15-1. Developer shall provide consistent column/bent designs throughout the Project.

All columns shall be rectangular or square; chamfered or filleted corners are acceptable. The towers of the New Harbor Bridge do not have to be rectangular or square.

Adverse visual impacts of conduits and drainage pipes shall be minimized through use of inset details and other design innovations on bents, columns, bridge beams, or retaining walls. Developer shall color all exposed pipe and fittings by pigmenting the resin to approximate the color of the finish applied to the adjacent concrete or steel.

Developer shall provide constant depth superstructures within bridge units. Developer shall not create an up-down effect by decreasing/increasing the structure depth in one unit then increasing/decreasing it in an adjacent unit. Bridge units shall consist of a minimum of two spans where variable structure depths are used.

15.3.3 Culverts

This section applies to all structures that traverse beneath a roadway, trail, driveway, or similar facility to convey something that would impede traffic if allowed to cross the road, trail, or driveway at grade.

Developer shall design and construct culverts and associated erosion control Elements to minimize their visibility from the roadway and to aesthetically blend with the adjoining context.

15.3.4 Retaining Walls

Retaining walls shall be designed as part of a cohesive architectural vision and shall visually complement the proposed bridge architecture. Developer shall design retaining walls with architectural surfaces consistent with requirements of Attachment 15-1.

15.3.5 Noise/Sound Walls

Developer shall design noise/sound walls to be similar in color, texture, and style to their proposed retaining walls and consistent with the requirements of Attachment 15-1.

Developer shall apply aesthetic treatments to the vertical surfaces of retaining and noise/sound walls where the surface is visible from the roadway or adjacent properties.

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

Developer shall clearly detail and identify how wall patterns shall be incorporated into the Final Design including typical layout elevations showing applied textures or patterns.

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

15.3.6 Traffic Railings

Except as noted, use Type T80HT Traffic Rail on the New Harbor Bridge and on bridges approaching the New Harbor Bridge. Type T80HT Traffic Rail is not required on direct connectors and ramps that approach the New Harbor Bridge.

15.3.7 Shared-Use Path

Provide drawings showing the shared-use path facility. Include plan and profile drawings, proposed cross sections, railing and ornamental fencing details, transition area layouts, shared-use path/roadway intersection layouts, terminations, informational signing and signal concepts, and surface and structural section designs.

15.3.8 Lighting

Developer shall design the aesthetic enhancement lighting with the following aesthetic criteria:

- Roadway Lighting – shall utilize one pole type for the entire corridor and shall be architecturally compatible with the shared-use path light fixture. Developer shall provide a lighting layout plan that addresses each light fixture category (e.g., roadside lighting, high mast lighting, under bridge) and type (e.g., LED, point source lighting, HID). Refer also to Attachment 15-1.
- Shared-Use Path Lighting – shall utilize one pole type for the entire corridor and shall be architecturally compatible with the roadway light fixture. Developer shall provide a lighting layout plan that addresses each light fixture category (e.g., roadside lighting, high mast lighting, under bridge fixture) and type o (e.g., LED, point source lighting, HID.)

15.3.9 Architectural Lighting

Developer shall prepare and submit an Architectural Lighting Plan for the New Harbor Bridge at least 35 Business Days before beginning the final design of these features. See Section 16 for additional lighting requirements.

15.3.10 Signing

This section applies to all signs installed on Right of Way as part of the Project and maintained by TxDOT or other Governmental Entity, including regulatory, advisory, directional, service, logo, and attraction signs. In addition to requirements in Section 16, Developer shall use uniform sign panel heights when sign placement requires more than one sign panel located on a signing structure.

15.3.11 Fencing

Fencing shall be designed with architectural character consistent with the other bridge Elements. Refer to requirements in Attachment 15-1.

15.3.12 Color and Surface Palette

As part of the Aesthetics and Landscaping Plans, Developer shall indicate where each color is to be applied. This plan can be diagrammatic in nature, but shall list each element and its colors. Developer shall consider color as an essential Project design element, integral to the design of other aesthetic Elements, including all bridge components, retaining walls, traffic barriers, fencing, etc. Developer shall submit color and surface finish palettes and actual color and surface samples 60 Business Days before beginning the construction of features to which they apply.

15.3.13 Trees, Shrubs, and Other Plant Materials

Developer shall utilize plant species native to or naturalized in the Project region. The overall landscape design, including plant types, sizes, density, and locations, shall be approved by TxDOT. Plants shall be selected considering the soil conditions, slopes and watering requirements.

15.3.14 Maintenance and Establishment Period

Developer shall be responsible for the care of all plants installed on the Project for the O&M Period after the date of Final Acceptance. Work shall be in accordance with the requirements of Section 19.

Throughout the O&M Period, Developer shall replace the plant materials when they are no longer in a healthy condition as determined by TxDOT, and make adjustments to the irrigation systems as directed by TxDOT. Developer shall make replacement plantings in the planting season, except as otherwise approved in writing by TxDOT. Developer shall remove dead plants within ten (10) Business Days of discovery, and Developer shall replace such plants during the next planting season. Replacements shall be of the same species and variety of the originally specified material, unless otherwise approved in writing by TxDOT, and shall be installed as specified by herein. If a replaced plant requires another replacement during the O&M Period, the new replacement shall also be covered for the O&M Period.

After Final Acceptance, TxDOT will review the completed landscape installation and irrigation systems with Developer on a quarterly basis during the roadside planting and establishment period. Plant material

health, mulching, erosion controls and other maintenance concerns will be specifically noted. Replacement needs will be noted and directed to Developer during the roadside planting and establishment period.

Developer shall monitor and control weeds in all planted areas for the duration of the O&M Period. If grassed areas develop weed or erosion problems, as determined by TxDOT, Developer will correct the problems for the duration of the O&M Period. Acceptance of vegetative establishment of all seeded areas will be required before Final Acceptance of Project. Acceptance will occur when grass has grown at least 2" high with 95% coverage provided no bare spots larger than one square foot exists.

15.3.15 Grading

This section applies to any disturbance of the existing landform or other modification, including any excavation (cutting) or embankment (filling) that alters the elevation of the existing landform.

The Developer shall design and construct grading so as to establish visual continuity between the topography of the highway corridor and the topography of the adjacent landscape.

15.3.16 Riprap

Concrete riprap shall be used in areas that will not support plant growth due to lack of sun and/or water and hard-to-reach mowing areas, such as but not limited to areas between, near, or next to guard fence posts, sign posts, bent columns, retaining walls, freeway ramp gores, paved ditches, flumes, and ditch inlets.

Concrete riprap shall be stamped and colored in accordance with Attachment 15-1.

15.3.17 Utilities

Developer shall design and place Utilities so as to minimize adverse visual impact.

Developer shall:

a) Coordinate the location of Utility cabinets with other design Elements so as to minimize adverse visual impacts.

b) Paint Utility cabinets to complement other structures within the Project area as outlined in Attachment 15-1.

c) Place Utilities so as to not preclude the placement of trees, shrubs, groundcovers, or other aesthetic Elements in the public Right of Way.

15.4 Construction Requirements

- Form liners: Developer shall receive Approval of the sample panels from TxDOT before any construction form liners are ordered, obtained, or used. Developer shall provide sample panels with a textured portion at least 5 ft x 5 ft and a representative un-textured surrounding surface. Developer shall provide TxDOT sample panels a minimum of sixty (60) Business Days in advance of starting construction of textured concrete surfaces. Developer shall construct sample panels in accordance with TxDOT Standard Specifications (2004) Item 427.4.B.2.d (Form Liner Finish), and with the approved Aesthetics and Landscaping Plan.

- Developer shall provide color samples from the Federal Standard 595C Colors Fan Deck and within the TxDOT Corpus Christi District Landscape and Aesthetics approved color stains palette. All samples shall be representative of the actual panel that will be placed. Primary, secondary and accent colors shall be displayed.

- For textured panels or concrete surfaces finished with a coating of paint or stain, Developer shall prepare a corresponding coated panel or surface area of an in-place Element for Approval prior to the coating operation.
- Pedestrian Fencing: Developer shall provide full-size mockups of the pedestrian fencing at least two panels long.
- Lighting: Developer shall supply a sample of each light fixture that is not a TxDOT standard.
- Beams: Developer shall paint all faces of the outermost beams.

15.5 Deliverables

Unless otherwise indicated, all deliverables shall be submitted in both electronic format and hardcopy format. Acceptable electronic formats are Microsoft Word, Microsoft Excel, or Adobe Acrobat (PDF) files, unless otherwise indicated. Drawings shall be submitted electronically in original MicroStation format and in Adobe Acrobat (PDF). The following list should not be considered all-inclusive and the Technical Provisions should be reviewed for any other deliverable items. All deliverables shall conform to the standards required in the Project Management Plan.

Deliverable	**Number of Copies**		**Submittal Schedule**	**Reference Section**
	Hardcopy	**Electronic**		
Aesthetics and Landscaping Plans	Three individually bound full-color, single-sided copies	Three CDs, DVDs, or USB drives with guidelines and all exhibits in PDF format	Shall be a condition of NTP2	15.2.2
3-D Visualizations	Three individually bound full-color, single-sided copies	Three CDs, DVDs, or USB drives with guidelines and all exhibits in specified formats.	Shall be a condition of NTP2	15.2.3
4-D Animations	NA	Three CDs, DVDs, or USB drives with HD WMV files	Within 90 Days of NTP2	15.2.4

Deliverable	Number of Copies		Submittal Schedule	Reference Section
	Hardcopy	Electronic		
Portable scale model of bridge	NA	NA	Within 120 Days of NTP2	15.2.5
Architectural lighting plan – cable stayed bridge and approach bridges	Three individually bound full-color, single sided copies	Three CDs, DVDs, or USB drives with exhibits in PDF format	35 Days prior to beginning Final Design of this feature	15.3.8
Color and surface palettes, including samples (3 in. x 5 in. min.)	Samples – three sets	PDF	60 Days prior to construction of features	15.4
Mock-ups and samples	Mock-ups – 1each Samples – 1each	PDF	Minimum 15 Days prior to construction	15.4

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

16.1 General Requirements

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

16.2 Administrative Requirements

16.2.1 Meetings

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

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

16.3 Design Requirements

Developer shall design all signing, delineation, pavement marking, and signalization in accordance with the *Texas Manual on Uniform Traffic Control Devices* (TMUTCD), TxDOT's *Standard Highway Sign Designs for Texas* (SHSD), TxDOT's Traffic Engineering Standard Sheets, TxDOT Corpus Christi District details (available in the RID), TxDOT's *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges*, adopted June 1, 2004 and Special Specifications, including their associated required special provisions, *TxDOT's Freeway Signing Handbook*, AASHTO's *A Policy on Geometric Design of Highways and Streets*, AASHTO's *Roadside Design Guide, and* TxDOT's *Roadway Design Manual*.

16.3.1 Final Design

Developer shall advance the Final Design of the signing, delineation, pavement marking, signalization, and lighting based on the preliminary operational signing schematic received with the Proposal. If a preliminary operational signing schematic does not exist, Developer shall prepare and submit a preliminary operational signing schematic for review and Approval by TxDOT and Federal Highway Administration (FHWA) prior to commencing Final Design. Before placing any signs, delineation, third party signs, non-standard sign structures, pavement markings, traffic signals, and lighting, Developer shall provide TxDOT a layout indicating the proposed location of such items.

16.3.2 Signing and Delineation

Developer shall design and install all signs as shown on the Final Design. Signs include new signs, as well as modifications to existing sign panels and structures. Developer's design shall include the locations of ground-mounted and overhead signs, graphic representation of all signs, proposed striping, delineation placement, guide sign and special sign details, and structural and foundation requirements. Signs shall be located in a manner that avoids conflicts with other signs, vegetation, dynamic message signs (DMS), lighting, and structures.

Developer shall ensure that signs are clearly visible, provide clear direction and information for users, and comply with TMUTCD requirements, TxDOT's *Standard Highway Sign Designs for Texas* and all applicable design requirement listed directly under Section 16.3.

Developer shall review with TxDOT all requests for new signs, including traffic generators, or modifications of existing sign text. Such requests are subject to TxDOT's Approval.

Developer's design of delineators and object markers shall comply with TMUTCD requirements, TxDOT's Traffic Engineering Standards and TxDOT's *Standard Specifications (2004)*.

Developer shall replace signs, including school signs and flashers, affected by the local street improvements.

On bridges, small signs are to be mounted on the outside of the bridge rail as required by TxDOT's Sign Mounting Standards.

Developer shall paint sign structures in accordance with TxDOT's Details to Paint Galvanized Steel (available in the RID).

16.3.3 Project Signs – Outside the Project ROW

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

16.3.4 Not Used

16.3.5 Not Used

16.3.6 Sign Support Structures

Developer shall determine foundation types and design sign foundations based upon geotechnical surveys/tests using Good Industry Practices. Designs for sign supports shall also comply with requirements in Sections 13 (Structures), 15 (Aesthetics and Landscaping) and TxDOT's traffic engineering standards.

Developer shall design sign support structures to provide a vertical clearance of not less than 19' between the pavement or bridge surface and the bottom of the lane control signals (LCS), if LCS is placed on a sign support structure. If no LCS are placed on a sign support structure, Developer shall design said sign support structure to provide a vertical clearance of not less than 21' between the pavement or bridge surface and the bottom of the sign.

Developer shall design sign support structures to provide horizontal clearance of not less than 1' between the sign support structure and back of barrier.

Developer shall design all overhead sign structures for Zone I, 100 mph wind zone as shown in the TxDOT Wind Velocity and Ice Zones Standard.

16.3.7 Pavement Marking

Developer shall ensure that the design and installation of all pavement markings comply with applicable TMUTCD requirements and TxDOT's Traffic Engineering Standard sheets.

Developer shall use 6" permanent contrast markings for lane lines on the controlled access mainlanes. Contrast markings consist of black background in combination with standard TMUTCD marking colors as indicated in the TxDOT Contrast and Shadow Pavement Markings standard CPM(1)-14.

Developer shall use 4" reflectorized profile pavement markings on mainlane and ramp edgelines.

16.3.8 Signalization

Traffic signal designs and modifications to existing traffic signals shall be completed in accordance with the current TxDOT standards and specifications, the TMUTCD, and the requirements of the appropriate Governmental Entity.

Developer shall install traffic signals at the following intersections:

a) Burleson Street at US 181

b) Lake Street at US 181

c) Leopard Street at SH 286

d) Comanche Street at SH 286

Developer shall provide complete operability of existing pedestrian travelways and pedestrian signals during construction. Developer shall prepare and submit signal timings for Approval by TxDOT before commencing with any work. Developer is responsible for the maintenance of the existing pedestrian travelways and pedestrian signals during construction.

16.3.8.1 Traffic Signal Requirements

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

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

Developer shall coordinate design and implementation of new or modified traffic signal systems with the TxDOT to ensure compatibility and interconnectivity with the TxDOT's traffic signal network. New or modified traffic signal equipment shall conform to the TxDOT's standards and requirements as specified in *TxDOT's Material Producer List*. At a minimum, Developer shall:

a) Design mast arms, poles, heads and foundations in accordance with TxDOT standards;

b) Use Polycarbonate Signal Heads

c) Not use strained pole signal design;

d) Use NEMA controllers and cabinets compatible with TxDOT Corpus Christi District equipment;

e) Install radar matrix detection systems at all traffic signals;

f) Use 3" conduit for electrical and communications;

g) Comply with the Utility Accommodation Rules for proper cover of conduit;

h) Comply with TxDOT Electrical Detail (ED) Standard Sheets

i) Developer shall paint traffic structures in accordance with TxDOT's Details to Paint Galvanized Steel (available in the RID).

j) Use LED lighting on all traffic signal indications; and

k) Provide training for TxDOT staff on all electronic items.

The radar matrix detection systems shall comply with the radar matrix detection systems specification in the RID.

Developer shall purchase and install traffic signal equipment that is compatible with TxDOT equipment and systems.

Developer shall provide both pedestrian and vehicle detectors at all traffic signals within the Site and shall comply with the *Texas Accessibility Standards* (TAS), the Americans with Disabilities Act (ADA) and TxDOT Special Specification 8835.

Developer is responsible for preparing traffic signal agreements (or supplements thereto) for execution by TxDOT and the appropriate Governmental Entity having operation and/or maintenance responsibilities.

16.3.8.2 Traffic Signal Timing Plans

Developer shall design signal timing plans for all new and modified traffic signals and shall submit to TxDOT for review. Developer shall coordinate and implement signal timing plans that optimize traffic flows and provide signal coordination with adjacent intersections and arterials for all existing and new traffic signals, modified signals, and interconnected signals. Unless timing maintenance is otherwise provided by a Governmental Entity, Developer shall be responsible for updating signal timing as necessary to maintain optimized flow. Signal timing and phasing plans at diamond interchanges shall conform to the coordinated signal phasing and timing of the corridor.

Developer shall provide copies of all final implemented signal timing plans.

16.3.8.3 Traffic Signal Warrants

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

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

Signal warrant studies shall be based on actual traffic and/or opening year traffic projections. If actual traffic volumes are not available, but opening year traffic is available, Developer shall use the procedure in Section 3.5 of the TxDOT *Traffic Signals Manual* to determine the volumes to be analyzed. If opening year traffic volumes are not available, opening year traffic volumes shall be calculated by applying a 50-percent reduction to the design year traffic projections. Developer shall conduct additional traffic signal warrant studies for all intersections located in the Project ROW, commencing six months after the Project is opened for traffic. If additional signals or modifications to existing signals are warranted, based on the traffic volumes obtained through these studies, Developer shall be responsible for installation of additional traffic signals or modification of previously-installed traffic signals. If, based on the above traffic counts, the need for a signal or signal modification is unclear, TxDOT will reasonably determine if the new signal or signal modification is required.

16.3.8.4 Traffic Signal Support Structures

Developer shall coordinate with TxDOT and the appropriate Governmental Entities to determine the type of traffic signal support structures.

16.3.8.5 Traffic Signal Systems

Developer shall make existing signal systems compatible with the proposed interconnections. Developer shall ensure continuous communication with the traffic signal system within the Site, and shall provide all communication hardware/equipment for TxDOT or the appropriate Governmental Entity to communicate with the signal systems within the Site using ENCOM or equivalent 5.8 Megahertz radio communications and fiber.

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

Developer shall provide to TxDOT, as part of the Final Design Documents, an acceptance test plan (ATP) for all traffic signals. This ATP shall also be submitted to the appropriate Governmental Entity. Developer shall conduct testing in accordance with the ATP and document those results to show conformance.

16.3.9 Lighting

Developer shall use high mast lighting at the US 181/SH 286/I-37 interchange and all locations along US 181, SH 286 and I-37 with a mainlane elevation below 75 feet; Developer shall design and construct conventional roadway lighting at all other locations throughout the limits of the project. Developer shall design the lighting through the entire project limits to prevent measureable spillage onto the adjacent properties using either cut-off shields or tightly-controlled photometrics combined with appropriate mounting height. Developer shall submit a lighting plan and light spillage measurements for the entire project limits to TxDOT for review and Approval. Developer shall design the lighting system to minimize or eliminate illumination of areas outside the Project ROW. In addition, the overflow of light onto any surface area outside of the roadway ROW shall not exceed 10 percent of the average horizontal illumination as defined in the TxDOT *Highway Illumination Manual*.

Where providing conventional roadway lighting, Developer shall use LED lighting.

Developer shall prepare lighting studies that consider illumination levels, uniformity, and sources for the roadways, interchanges, and special areas. Developer shall maintain an average horizontal luminance on the roadways as described below. Developer shall submit the photometric data results for all lighted areas within the Project limits to TxDOT for review and Approval. The submittal shall include all input data.

Lighting along cross streets shall be provided in locations where lighting systems are currently provided within the Project limits. All third-party requests for lighting within the Site shall be subject to TxDOT Approval.

Developer shall provide an average to minimum uniformity ratio of 3.1 an average lux of 6.5 to 8.6 on all traveled roadways to be illuminated. Traveled roadways include: mainlanes, frontage roads, interchanges, ramps, and frontage road intersections with cross streets.

Developer shall design lighting systems in accordance with Chapters 5, 6, 7, and 9 of the TxDOT *Highway Illumination Manual*. All design and construction shall comply with the latest TxDOT CAD Standard Plans and Specifications. At all times during the Term of the Agreement, Developer shall maintain safe lighting conditions along the Project roadway.

Conventional luminaire poles and breakaway bases shall be designed in accordance with AASHTO's *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. For all poles located within the clear zone of the roadways, Developer's design shall incorporate breakaway devices that are pre-qualified by TxDOT. Any high mast lighting poles shall meet TxDOT Standards and Specifications.

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

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

Developer shall not place ITS cable, fiber-optic lines, signal conductors, or any other non-lighting related cables or conductors in the lighting conduit, ground boxes, or junction boxes.

Developer shall minimize the potential hazards of lighting poles through the careful consideration of mounting options and pole placements, including the following options:

- Placing pole bases on existing or proposed concrete traffic barrier
- Placing poles behind existing or proposed concrete traffic barrier or metal beam fence
- Placing high mast lighting outside the clear zone, especially in roadway horizontal curves

Developer shall not place lighting on traffic signal poles.

Developer shall ensure that lighting structures comply with the Federal Aviation Administration (FAA) height restrictions near airport facilities. In the event that proposed or existing luminaires, mast arms, or poles infringe into an airport's or heliport's base surface, Developer shall coordinate with the FAA and TxDOT to permit or relocate such structures. If FAA restrictions prohibit lighting structures from being placed in certain areas near an airport facility, Developer shall find alternative ways of providing the required level of lighting.

16.3.9.1 Additional Requirements

Additional requirements are as follows:

a) High-mast lighting must not infringe into residential areas adjacent to the Project ROW.

b) Developer must coordinate with the FAA, USCG and the Port of Corpus Christi Authority regarding installation of obstruction and navigational lights, on a case-by-case basis. Developer shall conform obstruction and navigational lighting to the most current versions of FAA's *AC No. 150/5345-43E*, FAA's *AC No. 70/7460-1K*, FAA's *14 CFR Part 77.9*, USCG's *Bridge Administration Manual*, USCG's *Bridge Lighting and Other Signals*, USCG's *Bridge Lighting and Fender Systems* and USCG's *Part 118 Bridge Lighting and Other Signals*.

c) At a minimum, underground conduit in interchange areas or temporary detours shall not be less than 2" or Schedule 80 polyvinyl chloride (PVC); all other underground conduit installations shall not be less than 2" or Schedule 40 PVC.

d) The minimum conductor size shall be #8 AWG copper. Developer shall not use duct cable for illumination purposes.

e) Developer shall place bridge lighting brackets that meet with TxDOT's Bridge Lighting BL Standard.

f) If overhead electric lines confine the placement of luminaires, Developer may use special davit-arm luminaires.

g) Minimum inside dimensions for ground boxes shall be 11.5 inches (width) by 21 inches (length) by 10 inches (depth).

h) Ground box covers shall be 2-inch-thick (nominal), nonconducting material and labeled "Danger High Voltage Illumination".

i) Riprap aprons shall be provided around all ground boxes.

j) Lights shall have an identification tag denoting a contact person or office in case of emergency or for maintenance, and the address and telephone number.

k) Electrical part of the installation shall be designed and installed in conformance with the most current version of the National Electrical Code (NEC) at time of NTP2.

16.3.10 Visual Quality

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

Developer shall not use timber poles for permanent installation.

Developer shall re-sod or re-seed areas of construction disturbed by the installation of signs, traffic signal systems, or lighting systems after final installation.

16.4 Construction Requirements

16.4.1 Permanent Signing and Delineation

Developer shall use established industry and utility safety practices to erect and remove signs located near any overhead or underground utilities, and shall consult with the appropriate Utility Owner(s) prior to beginning such Work. Developer shall stake each sign location in the field and provide TxDOT 72 hours' notice prior to installation of any sign.

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

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

16.4.2 Permanent Pavement Marking

Developer shall meet the following minimum retroreflectivity values for edge line markings, centerline/no passing barrier line markings, and lane line markings when measured any time after three (3) days but not later than ten (10) days after application:

a) Type I, Thermoplastic, Pavement Markings:

- White markings: 250 millicandelas per square meter per lux (mcd/m2/lx)
- Yellow markings: 175 mcd/m2/lx

16.4.3 Permanent Signalization

Developer shall coordinate with the Utility Owner(s) and ensure necessary power service is initiated and maintained for permanent signal systems. Developer shall ensure power is provided to all Developer-installed signals and that such signals are metered to enable compliance with the responsibilities for power consumption costs in Section 19.10.2. Developer shall stake each pole location in the field and provide TxDOT 72 hours' notice prior to installation of any foundation.

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

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

During the test period the developer must provide a contact that can handle emergency calls 24 hours/day for all new signals.

16.4.4 Permanent Lighting

Developer shall coordinate with the Utility Owner(s) and ensure power service is initiated and maintained for permanent lighting systems. Where the Work impacts existing lighting, Developer shall maintain existing lighting as temporary lighting during construction to ensure continuous lighting throughout; and restore or replace prior to Substantial Completion. At all times during the Term, safe lighting conditions

shall be maintained along the Project roadway. Developer shall stake each pole location in the field and provide TxDOT 72 hours' notice prior to installation of any foundation. The Developer shall maintain the existing illumination during construction and installation of the new illumination; including high-mast lighting.

Developer shall remove all old illumination-related cable and conduit that does not have existing pavement or riprap above it; any existing illumination-related cable and conduit that is under the existing pavement or riprap may be abandoned.

Developer shall place all bore pits safely away from traffic, provide positive barrier protection, and provide necessary signs to warn of the construction area.

Developer shall contact Utility Owners regarding their specific required working clearance requirements.

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

16.4.5 Reference Markers

Developer shall place reference markers and/or mile markers at approximately one mile apart in accordance with the Texas Reference Marker System. Developer shall set reference markers and/or mile markers according to the TMUTCD. Once placed, Developer shall inventory and record reference markers with GPS. Developer shall provide this information to TxDOT in Microsoft Excel format.

17 INTELLIGENT TRANSPORTATION SYSTEMS

17.1 General Requirements

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

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

Developer shall be responsible for the design, installation, and maintenance of safe and functional ITS for the Project using Good Industry Practice. All components of the ITS shall conform to the provisions of the National Transportation Communication for ITS Protocol (NTCIP) and the ITS Specifications. Develop shall provide and install ITS components which are compatible with the TxDOT Lonestar™ Advanced Traffic Management System (ATMS).

Within the first six months of the construction, wireless broadband radios shall be set up as the communications link to the existing DMS and existing and proposed cameras.

Developer shall install all conduits, communication systems, and powers for both distribution in the local area and communication and transmission over the new bridge.

17.2 Design Requirements

Developer shall provide a complete and operational ITS network throughout the Project that is expandable as capacity is increased along the Project roadways, utilizes hardware and software components consistent and compatible with TxDOT in the manner described in this Section 17.2 and the other affected Governmental Entities, resistant to weather encountered in the Project area, and places components in locations that are not hazardous to Users. Developer shall prepare a preliminary ITS layout for review and concurrence by TxDOT to ensure adequate planning of the ITS implementation.

Developer shall coordinate with TxDOT Corpus Christi District Traffic Management Center (TMC).

Subject to the specific requirements of this Section 17, Developer shall determine the number and specific locations of all ITS components based on the requirements in this Section 17.2. The ITS shall consist of all equipment necessary to implement the ITS described in this Section 17.2.

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

17.2.1 ITS Communications Requirements

The communications network shall serve the highway ITS component of the Project. Developer shall connect the communications network to TxDOT's 144-strand fiber optic trunk line located along SH 286, as part of the Corpus Christi District ITS earmark project. The trunk line will feed the City Hall, County Courthouse and the City's EOC from Leopard St/SH 286 diamond interchange. Where necessary, as determined by TxDOT, Developer shall provide communication node buildings and cabinets to support the communications network.

The ITS communications trunk line shall comprise of 144-strand fiber optic cable along the new Harbor Bridge and the new segment of I-37. Developer shall install the fiber optic cable in accordance with the ITS Specifications (Item 6014 Fiber Optic Cable).

17.2.2 Conduit

Developer shall determine the type, quantity, and design of the conduit above and below ground, ground boxes, and all communication cable and electrical conductors to support the ITS network and operations. Conduit shall be 3" in diameter. The conduit shall support a minimum of 144-strand fiber optic cable and be in a different duct bank than conduit for other elements.

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

Developer shall use departmental material specifications for conduit and ground box types.

Across the New Harbor Bridge, Developer shall install lateral conduit runs with fiber communications and a 2'x 2'x 2' junction box and pole every 500 feet that will terminate near the rail.

17.2.3 CCTV Cameras

Developer shall install and ensure functionality of CCTV cameras for Incident verification and traffic management. The system of cameras shall accurately identify all vehicle(s) involved in an Incident or Emergency, the extent of vehicle(s) damage, and if applicable the likelihood of personal injury. Operation of the cameras shall result in no visual delay in response of the camera pan/tilt/zoom by a user.

Developer shall provide and install the CCTV field equipment in accordance with the ITS Specifications (Item 6025 CCTV Field Equipment). Developer shall maintain existing and proposed CCTV field equipment within the Project limits during the construction. Fiber optic network is the preferred communications.

17.2.3.1 Equipment

Developer shall install and ensure functionality of necessary CCTV equipment, including cameras, camera controls, cables, and connections. Developer shall provide all the equipment necessary for TxDOT secondary control of all CCTV cameras. The method of secondary control shall be in accordance with TxDOT standards and specifications.

Developer shall provide a digital video format and communications protocol at all connections with TxDOT systems. The format and protocol provided by Developer shall be compatible with systems in use by TxDOT, and if necessary convertible for use by TxDOT's in-place ITS network.

17.2.3.2 Placement

Developer shall provide CCTV cameras as described in this Section 17.2.3.2. CCTV cameras shall be placed to enable TxDOT to monitor traffic conditions on highway lanes, frontage roads, connecting facilities, and entrance and exit ramps, and messages displayed on any remotely-controlled dynamic message signs in the Project area. To provide a stable video image, Developer shall mount cameras on dedicated structures unless otherwise approved by TxDOT.

Developer shall install CCTV cameras and ENCOM, or equivalent 5.8 Megahertz radio communications at all interchanges with new US 181 segment, including Burleson Street, and I-37, and at a maximum of one mile spacing along US 181 within the Project limits. Developer shall also install CCTV cameras at all interchanges with the new I-37 segment, including Broadway Boulevard, Staples Street and New Port Avenue, and at a maximum of one mile spacing along I-37 within the Project limits. Developer shall measure the one mile spacing starting from the interchanges. If the distance between interchanges is less than two miles, Developer shall install a minimum of one CCTV camera in between the interchanges. Developer shall install new CCTV cameras at the two towers of the New Harbor Bridge.

Developer shall provide 6 replacement cameras with ENCOM, or equivalent 5.8 Megahertz radio communications to be installed by TxDOT within 180 days of NTP2.

Developer shall ensure that all CCTV cameras within the project limits have ENCOM, or equivalent 5.8 Megahertz radio communication and fiber connectivity in accordance with this Section 17 prior to Final Acceptance.

Developer shall perform a sight line study prior to installation to ensure 100% coverage of the Project.

17.2.3.3 Video Requirements

Developer shall install and ensure functionality of state-of-the-art CCTV cameras that meet the following requirements. At any time prior to Final Acceptance, should any CCTV cameras fail to meet any of the following criteria, Developer shall replace such cameras within 48 hours of discovery of lack of compliance.

a) Solid-state design with digital signal processing (DSP) for digital zoom
   - for auto/manual long-term integration (exposure) control, with built-in frame buffer
   - for auto-focus; for built-in I.D. generator, with white letters and black outline

b) Conformance to a minimum of National Television System Committee (NTSC) video output and Electronic Industries Alliance (EIA)-170A standards

c) No less than 30 frames per second (fps) color

d) Able to produce clear, low-bloom, low-lag video pictures under all conditions, from bright sunlight to nighttime scene illumination of 0.02 foot-candles

e) Maintenance of color quality by a continuous, through-the-lens, automatic, white balance for color temperatures from 2850 degrees Kelvin to greater than 5100 degrees Kelvin, with less than 10 Institute of Radio Engineers (IRE) units unbalance

f) Aspect ratio of 4:3

g) Zero geometric distortion

h) Signal to noise distortion of 55 dB with AGC off

i) Built-in auto focus and auto iris

j) Overexposure protection to prevent permanent damage to cameras when pointed at strong light sources, including the sun, for brief periods of time

17.2.3.4 Operating Requirements

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

a) Wind load of 100 mph without permanent damage to mechanical and electrical equipment

b) Ambient temperature range of -35 degrees Fahrenheit to +140 degrees Fahrenheit

c) Relative humidity range not to exceed 95 percent within the temperature range of +40 degrees Fahrenheit to +110 degrees Fahrenheit

d) Humidity range of 0 to 100 percent condensing

17.2.3.5 Control Requirements

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

a) Vertical movement of + 40 degrees to – 90 degrees

b) Horizontal movement of 360 degrees

c) Tilt speed of 20 degrees per second

d) Pan speed of 100 degrees per second

e) Simultaneous pan and tilt

f) RS-232 serial communications

17.2.4 Vehicle Detection

Developer shall provide permanent detection in each highway lane of the Project that measures vehicle classification, vehicular volume, lane occupancy and speed information on the roadway using radar vehicle sensing devices (RVSD). The RVSD units shall meet the requirements in the ITS Specifications.

Vehicle detection sensors shall determine vehicle speed for each vehicle passing the sensor. Developer may attach detection units to existing structures with prior concurrence from TxDOT. Where an existing structure is not available, or in lieu of attaching the detection unit to an existing structure, Developer shall install a mounting pole solely for the vehicle detector. Any mounting poles placed specifically for ITS items shall conform to the ITS Specifications (Item 8821 Radar Vehicle Sensing Device).

Developer shall place RVSD units:

a) At every entrance ramp and exit ramp within the Project limits;

b) Every two miles along both I-37 and US 181 mainlanes, in each direction; and

c) At each direct connector at the I-37 and US 181 interchange.

17.2.5 Road Weather Information System

Developer shall provide environmental sensor stations (ESS) to measure temperature, humidity, wind speed and direction, barometer, precipitation on the Harbor Bridge.

17.2.6 Emergency Callbox

Developer shall provide callboxes on the Harbor Bridge containing direct line telephone for emergency use. Developer shall provide two callboxes each per northbound and southbound sides of Mainlanes.

17.2.7 Dynamic Message Signs

Developer shall provide a comprehensive network of electronic dynamic message signs (DMS) using only light-emitting diode (LED) display technology. The DMS shall meet the requirements in the ITS Specifications.

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

DMS shall conform to the TxDOT special specification National Transportation Communications for ITS Protocol for Dynamic Message Signs and shall demonstrate compliance before installation of DMS.

DMS shall be used to inform motorist of the availability of alternate routes, and to advise travelers of adverse road conditions and congestion. DMS shall be placed to provide a driver-friendly sign-viewing angle at each DMS location.

Developer shall place new DMS at the each following approximate locations:

a) In the southbound I-37 direction:

- Between Sam Rankin Street and Buffalo Street.

b) In the northbound I-37 direction:

- Between Buffalo Street and Sam Rankin Street.

Within 180 days of NTP2 Developer will provide the sign portion of the DMS including ENCOM, or equivalent 5.8 Megahertz radio communications; for installation by TxDOT at the existing locations listed below:

- SB US 181 just south of Moore Avenue;
- SB US 181 just south of Beach Street;
- NB SH 286 near Tarlton Street;
- EB I-37 near Buddy Lawrence Avenue

Developer shall ensure that all DMS within the project limits have ENCOM, or equivalent 5.8 Megahertz radio communication and fiber connectivity in accordance with this Section 17 prior to Final Acceptance.

17.2.8 Communication Hub Enclosures/Communication Cabinets

Developer shall coordinate with TxDOT the connection of all new ITS components to the existing ITS communication hub enclosures and communication cabinets covering the Project. Developer shall connect the Project ITS network to the TxDOT fiber hub located on the Project described in Section 17.2.1.

17.3 Construction Requirements

17.3.1 General

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

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

Developer shall provide the following data prior to Final Acceptance:

a) Freeway Management System Geographic Information System (FMGIS) data by providing survey information (NAD83 and latitude/longitude) for all poles, ground boxes, controller cabinets, and overhead sign structures;

b) Digital photos and serial numbers of all poles, controller cabinets, elements in controller cabinets and overhead sign structures; and

c) Fiber optic cable and channel assignments and distribution, to include all patch panel, fiber jumpers and fiber trays.

17.3.2 Salvaging Existing Items

Developer shall salvage all existing ITS equipment removed during construction of the Project, deliver to the TxDOT Corpus Christi District Office at 1701 South Padre Island Drive, Corpus Christi, TX 78416, and stockpile as requested by TxDOT, all in an undamaged condition.

17.3.3 Existing ITS Relocation

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

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

18 TRAFFIC CONTROL

18.1 General Requirements

Developer shall design, construct, operate and maintain the Project, in conformance with the requirements stated in this Section 18, to provide for the safe and efficient movement of people, goods, and services, through and around the Project, while minimizing negative impacts to Users, residents, and businesses. Developer shall coordinate with local government entities on the development of the Traffic Management Plan (TMP).

Developer shall be responsible for gaining Approval from TxDOT and the appropriate Governmental Entity or property owner on each intersecting street or driveway closure.

Unless stated otherwise, the requirements of this Section 18 apply to the Construction Period and the O&M Period and references to construction apply to both Construction Work and Renewal Work.

During all phases, temporary or existing Intelligent Transportation System (ITS) equipment, street lights, and traffic signals shall remain in operation such that the new and existing equipment operate as a coherent system.

Developer shall allow for the left and right turn movements from Beach Avenue and Burleson Street to US 181 Frontage; left and right turn movements from Leopard Street and Comanche Street to SH 286 Frontage; and left and right turn movements from Staples Street and North Shore Avenue to I-37/I-37 Frontage.

18.2 Administrative Requirements

18.2.1 Traffic Management Plan

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

a) Descriptions of the qualifications and duties of the traffic engineering manager, traffic control coordinator, and other personnel with traffic control responsibilities

b) Procedures to identify and incorporate the needs of transit operators, Utility Owners, Governmental Entities, local governmental agencies, Emergency Services providers, school districts, business owners, and other related Users, Customer Groups or entities in the Project corridor and surrounding affected areas

c) Procedures for obtaining acceptance of detours, road and Lane Closures and other traffic pattern modifications from applicable Governmental Entities, and implementing and maintaining those modifications

d) Procedures for signing transitions during construction from one stage to the next and from interim to permanent signing

e) Procedures for maintenance and replacement of traffic control devices, including pavement markings and traffic barriers, if used

f) Procedures to regularly evaluate and modify, if necessary, traffic signal timings, and the procedures for the development, TxDOT Approval, implementation, testing, and maintenance of all affected signals

g) Procedures to coordinate with the appropriate Governmental Entities operating signal networks along the Project or Project detour routes to ensure temporary system compatibility, establish

responsibilities for temporary signal installation, maintenance, operation and removal, and coordinate traffic signal timing with local signal networks

h) Procedures and process for the safe ingress and egress of construction vehicles in the work zone

i) Provisions to provide continuous access to established truck routes and Hazardous Material routes, and to provide suitable detour routes, including obtaining any Approvals required by the appropriate Governmental Entities for these uses

j) Procedures to modify plans as needed to adapt to current Project circumstances including a contingency plan to alleviate unreasonable construction-related back-ups that can be implemented immediately upon notification from TxDOT

k) Procedures to communicate TMP information to Developer's public information personnel and notify the public of maintenance of traffic issues in conjunction with requirements of Section 3

l) Descriptions of contact methods, personnel available, and response times for any deficiencies or Emergency conditions requiring attention during off-hours

m) Procedures for night work (9:00pm to 5:00am) to include a work zone light system design in accordance with NCHRP Report 498 – *Illumination Guidelines for Nighttime Highway Work*

n) Developer shall notify the traveling public by placing changeable message signs a minimum of seven (7) Days in advance of actual roadway closure or major traffic modifications. Where available and when possible, Developer shall coordinate and utilize DMS on the regional ITS system.

o) Developer shall utilize uniformed officers to affect Lane Closures. Developer shall be responsible for the costs associated with the use of uniformed officers.

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

18.3 Design Requirements

18.3.1 Traffic Control Plans

Developer shall use the procedures in the TMP, TxDOT standard drawings, and TMUTCD requirements to develop detailed traffic control plans which provide for all construction stages and phasing, as well as all required switching procedures. Traffic control plans are required for the Work during the Term of the Agreement including D&C and O&M Periods.

Developer shall produce a traffic control plan, (TCP) for each and every phase of Work that impacts traffic and involves traffic control details and shall coordinate with appropriate Governmental Entities on the development of the plan. Developer is responsible for obtaining all necessary permits from such local entities to implement the plans.

Developer shall provide TxDOT with a TCP concept presentation for Approval at or near 30% design status but prior to TCP plan sheet development. The Developer shall utilize PowerPoint and roll plots to convey this concept at a TCP concept presentation meeting.

Each TCP shall be submitted to TxDOT for review a minimum of ten (10) Days prior to implementation. The traffic control plan shall include details for all detours, traffic control devices, striping, and signage applicable to each phase of construction. Information included in the traffic control plans shall be of sufficient detail to allow verification of design criteria and safety requirements, including typical sections, alignment, striping layout, drop off conditions, and temporary drainage. The traffic control plans shall

clearly designate all temporary reductions in speed limits. Changes to posted speed limits will not be allowed unless specific prior Approval is granted by TxDOT.

18.3.1.1 Traffic Control Plan Requirements and Restrictions

Developer's TCP shall comply with the following requirements and restrictions:

Opposing traffic on a normally divided roadway shall be separated with appropriate traffic control devices in accordance with Good Industry Practice and TMUTCD based on roadway design speed**.** Approved traffic control devices can be found in TxDOT's *Compliant Work Zone Traffic Control Device List* (CWZTCD list).

Work cannot be performed at any time over live traffic; unless prior approval is given by TxDOT.

Developer cannot put traffic on milled travelway surfaces; unless prior approval is given by TxDOT.

Developer shall set a designated route for trucks/Hazardous cargo.

Developers shall include procedures to accommodate evacuation traffic in the event there is an evacuation called.

Developer shall maintain existing pavement within each work zone in accordance with Section 19 of the Technical Provisions.

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

Throughout the duration of the Project, Developer shall ensure all streets and intersections remain open to traffic to the greatest extent possible by constructing the Work in stages. Developer shall maintain access to all adjacent streets and shall provide for ingress and egress to public and private properties at all times during the Project. Lane Rental Charges and/or Liquidated Damages will be assessed in accordance with the Agreement when access to any property, public or private, is restricted in contradiction to a Traffic Control Plan.

Developer shall prepare public information notices, in coordination with Section 3, in advance of the implementation of any Lane Closures or traffic switches. These notices shall be referred to as "Traffic Advisories".

18.3.1.2 Design Parameters for Traffic Control Plans

Design Vehicle. Turning movements on all local streets and driveways shall, at a minimum, provide similar characteristics as existing.

Design Speed. On I-37, US 181 and SH 286, the design speed shall be 60 miles per hour (mph) or greater. If the existing posted speed limit is less than 45 mph, the design speed shall be no more than 10 mph below the posted speed limit along the facility at that location.

Number of Lanes. The minimum number of lanes to be maintained during the Construction Period and the O&M Period shall be as described in Section 18.3.1.3. Lane Closure requests by Developer on Related Transportation Facilities may be considered for Approval by TxDOT in its sole discretion, within reason, and may be acceptable, so long as all traffic patterns and accesses are maintained.

Lane Widths. During construction, the minimum lane width for mainlanes, arterials and major crossing streets is 11 feet. For minor crossing streets, TxDOT may, in its sole discretion, allow 10' lanes in limited circumstances during construction for short distances after reviewing Developer's Traffic Control Plan.

Shoulders. A minimum one foot offset from the edge of travel way to the edge of pavement or traffic barrier is required.

Barrier. Existing permanent barrier cannot be relocated and re-used.

18.3.1.3 Allowable Lane and Roadway Closures

Lane Closures will only be permitted as part of a Traffic Control Plan when Developer can demonstrate that the Lane Closure will provide clear benefit to the progress of the Construction Work and/or is necessary to complete O&M Work. Lane Closures must be coordinated with Related Transportation Facilities. Where multiple requests for traffic control from Developer and Governmental Entities that would adversely affect Users if implemented simultaneously, TxDOT will give priority to the closure submitted first. Law enforcement must be present with marked vehicles during Lane Closures.

Lane Closure. Developer shall not be permitted to implement a Lane Closure on mainlane during any Period C, as defined in Section 18.3.2 (Time Period for Lane Closures) other than the closure of a shoulder. Developer may submit a request for a Lane Closure in either direction, as part of a Traffic Control Plan, provided that the Lane Closure occurs entirely within a Period B as defined in Section 18.3.2 and provided that a minimum of two roadway lanes in each direction are maintained for mainlanes. During any Period A, as defined in Section 18.3.2, the number of roadway lanes may be reduced to one lane in each direction where the Lane Closure is essential for the safe performance of Construction Work and/or O&M Work.

For planned Lane Closures and Emergency event lane closures, as appropriate, Developer shall coordinate lane closures that may affect crossing TxDOT facilities with appropriate TxDOT district and area offices, as needed, to ensure that no conflicts occur. Developer shall provide advance notification of all Lane Closure notices to the appropriate TxDOT district and area office. Developer shall make every effort to avoid impacts to identified Environmental Justice communities/neighborhoods due to construction activities and development of detour routes. TxDOT will provide appropriate contacts and information upon request.

If bridge beam erection cannot be accomplished safely within these requirements, Developer may utilize weekend road Closures between 9:00 pm Friday and 6:00 am Monday. Developer shall seek TxDOT's Approval for such traffic closures and shall provide a minimum of two weeks' notice of such Closures.

Any complete roadway closure shall occur during Night-time Hours and shall require the Developer to develop a Traffic Control Plan with detours to be submitted and approved by TxDOT.

Ramp Closures. Developer shall not close two consecutive entrance ramps or two consecutive exit ramps at the same time.

Direct Connect Closures. Developer shall coordinate shutdowns of direct connects with the existing bridge and corresponding direct connects.

Driveway Closures. Developer shall maintain a minimum of one driveway per business at all times. For businesses with multiple driveways, when driveway closure is necessary to progress Work, no driveway may be closed for more than thirty (30) consecutive days or more than forty-five (45) days in a ninety (90) day period.

18.3.1.4 Detour Usage

Developer shall use State routes for detour routes, wherever applicable. If State routes are unavailable, Developer shall use local arterials, provided that Developer has obtained the necessary permits from the Governmental Entity having jurisdiction.

Developer shall provide motorists with guidance on diverting around the construction, detouring around specific construction sites, and traveling through the construction areas. This shall include the installation and maintenance of temporary regional signs and changeable message signs to divert traffic around the Project. Motorist guidance to and along detour routes shall be provided, together with regional guidance.

18.3.2 *Time Period for Closures*

Table 18-1 shows the period, A, B or C, for each of the hours of the day. These periods are referenced in Exhibit 17 of the Agreement and are used to determine Lane Rental Charges and Liquated Damages for Lane Closures. Table 18-1 is applicable for all the roadways in the Project.

Table 18-1 Period Per Hour of the Day

Hour	Period	Hour	Period
12:00am - 1:00am	Period A	12:00pm - 1:00pm	Period B
1:00am - 2:00am	Period A	1:00pm - 2:00pm	Period B
2:00am - 3:00am	Period A	2:00pm - 3:00pm	Period C
3:00am - 4:00am	Period A	3:00pm - 4:00pm	Period C
4:00am - 5:00am	Period A	4:00pm - 5:00pm	Period C
5:00am - 6:00am	Period A	5:00pm - 6:00pm	Period C
6:00am - 7:00am	Period B	6:00pm -7:00pm	Period B
7:00am - 8:00am	Period B	7:00pm - 8:00pm	Period B
8:00am - 9:00am	Period B	8:00pm - 9:00pm	Period A
9:00am - 10:00	Period B	9:00pm -10:00pm	Period A
10:00am - 11:00am	Period B	10:00pm - 11:00pm	Period A
11:00am - 12:00pm	Period B	11:00pm - 12:00am	Period A

18.3.3 *Restricted Hours*

A. Holiday Restrictions

No Lane Closure that restricts or interferes with traffic shall be allowed from noon on the day preceding to 10:00 pm on the day after the following holiday schedule. TxDOT has the right to lengthen, shorten, or otherwise modify these restrictions as actual traffic conditions may warrant:

a) New Year's Eve and New Year's Day (December 31 through January 1);

b) Easter Holiday Weekend (Friday through Sunday);

c) Memorial Day Weekend (Friday through Monday);

d) Independence Day (July 3 through noon on July 5);

e) Labor Day Weekend (Friday through Monday);

f) Thanksgiving Holiday (Wednesday through Sunday); and

g) Christmas Holiday (December 23 through December 26).

h) Buccaneer Days (Friday through Sunday)

i) Spring Break Week of March

B. Event and Spring Break Restrictions

Developer shall coordinate with TxDOT regarding Lane Closures during regional events and each week before and after Spring Break week as referenced in 18.3.2(i). TxDOT has the right to lengthen, shorten, or otherwise modify restrictions as actual traffic conditions may warrant. TxDOT also has the right to add major events as they are warranted.

18.4 Construction Requirements

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

18.4.1 Developer Responsibility

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

Developer shall provide TxDOT the names of the Traffic Control Coordinator and support personnel, including a backup coordinator in the event the primary coordinator is unavailable, and the phone number(s) where they can be reached 24 hours per day, seven (7) days per week.

18.4.2 Access

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

18.4.3 Detours

Developer shall maintain all detours in a safe and traversable condition. A pavement transition, suitable for the posted speed of the section shall be provided at all detour interfaces.

Developer shall use State routes for detour routes, wherever applicable. If State routes are unavailable, Developer shall use local arterials, provided that Developer has obtained the necessary permits from the Governmental Entity having jurisdiction.

Developer shall provide motorists with guidance on diverting around the construction, detouring around specific construction sites, and traveling through the construction areas. This shall include the installation and maintenance of temporary regional signs to divert traffic around the Project. Motorist guidance to and along detour routes shall be provided, together with regional guidance.

18.4.4 Local Approvals

Developer shall communicate any ramp closure and staging analysis with each Governmental Entity having jurisdiction for roads that may be affected by the Project. When ramp movements are diverted or detoured along existing roads, Developer shall be responsible for any and all user costs and schedule risk that may be assessed for the use of these existing roads. This may include traffic operation analysis, temporary traffic control devices, and road user costs, all payable to the applicable Governmental Entity. Developer shall be responsible for obtaining the necessary Approvals from agencies having jurisdiction over the routes used.

18.4.5 Pavement Markings and Signing

Developer shall remove existing pavement markings and/or signs that conflict with temporary or permanent pavement markings. These pavement markings and signs shall be removed by any method that does not materially damage the existing elements or facilities. Pavement marking removal by over-painting is prohibited. Existing striping shall be covered with Gr 5 sealcoat. Developer shall use a flailing device to remove striping. Developer shall not use temporary tape at any time during the project.

Developer shall be responsible for temporary signing outside of the Project limits required for the Project. DMS signs shall comply with TxDOT Standard BC(6)-13.

Developer shall maintain safe travelling conditions of all roadways used outside the project limits including routes to fabrication facilities, plants and haul roads.

18.4.6 Reinstatement of Utility Cuts

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

18.4.7 Hauling Equipment

Developer shall keep traveled surfaces used in its hauling operations clear and free of dirt or other debris that would hinder the safe operation of roadway traffic.

Rubber-tired equipment shall be used for moving dirt or other materials along or across paved surfaces.

Where Developer moves any equipment not licensed for operation on public highways on or across any pavement, Developer shall protect the pavement from all damage caused by such movement. Any damage caused by the operation of Developer shall be repaired at the expense of Developer.

All haul routes utilizing any street of an adjacent Governmental Entity shall be coordinated with the appropriate Governmental Entity

18.4.8 Final Clean-Up

Developer shall clear and remove from the site all surplus and discarded materials and debris of every kind and leave the entire Project in a smooth and neat condition, after any construction process.

18.4.9 Stockpiles

Barricades and warning signs are to be placed at stockpiles to adequately warn motorists of a hazard in accordance with TxDOT's Traffic Engineering Standard sheets and the TMUTCD. All material stockpiles shall not be located within the clear zone of any traveled lane, unless positive protection is provided.

19 MAINTENANCE

19.1 General Requirements

19.1.1 O&M Work Durations

Developer shall perform O&M Work including O&M During Construction and O&M After Substantial Completion for the Maintained Elements within the O&M Limits for the durations shown on Table 19-1. Developer shall establish and maintain an organization that effectively manages all O&M Work in a manner set forth in the approved Maintenance Management Plan (MMP).

Table 19-1: O&M Work Durations

	O&M During Construction	O&M After Substantial Completion
New Harbor Bridge	Not Applicable	Commences at Substantial Completion and continues until the expiry of the O&M Period (25 years) unless subject to earlier Termination under the terms of the Agreement.
Existing Harbor Bridge and Approaches	Commences at start of Phase 2 (NTP3) and continues until Demolition Completion. Upon commencement of Demolition Work, Developer shall implement that portion of the MMP applicable to the Existing Harbor Bridge and its approaches and all requirements included therein.	Not Applicable
Roadway Section	Commences at NTP2 and transitions to O&M After Substantial Completion responsibilities at Substantial Completion	Commences at Substantial Completion and continues until the expiry of the O&M Period (25 years) unless subject to earlier Termination under the terms of the Agreement.
Related Transportation Facilities Within the O&M Limits	Commences when Work first begins on a section in compliance with an approved Traffic Management Plan and continues until maintenance responsibility is handed over to the applicable Governmental Entity at Substantial Completion as described in Section 18.	Not Applicable – Related Transportation Facilities after Substantial Completion will be operated and maintained by relevant Governmental Entity.

19.1.2 General Maintenance Obligations

Developer shall take all necessary actions to achieve the following:

a) Coordinate activities of other entities with interests within the Project Limits, including but not limited to: Port of Corpus Christi, Department of Homeland Security, United States Coast Guard, and Emergency Services.

b) Provide response to Incidents and Emergencies, including management and reporting.

c) Conduct regular patrols of all lanes within the O&M Limits to identify conditions that are unsafe or have the potential to become unsafe, conditions that could threaten the infrastructure, and to attend to existing or changing conditions.

d) Minimize delay and inconvenience to Users and, to the extent Developer is able to control, users of Related Transportation Facilities.

e) Monitor and observe weather and weather forecasts to proactively deploy resources to minimize delays and safety hazards due to heavy rains, snow, ice, or other severe weather events.

f) Minimize the risk of damage, disturbance, or destruction of third-party property during the performance of O&M Work.

g) Coordinate with and enable TxDOT and others with statutory duties or functions in relation to the Project to perform such duties and functions.

h) Perform systematic Project inspections, Routine Maintenance, Renewal Work and Operational Services in accordance with the provisions of the MMP and the Contract Documents.

i) Promptly investigate reports or complaints received from all sources.

19.1.3 Developer's Maintenance Facility

Developer shall provide an office facility (the "Developer's Maintenance Facility") which shall comply with the following:

a) Shall be suitable for managing the performance of the O&M Work.

b) All O&M Records shall be available for inspection at this location

c) Shall be located no more than 5 minutes' travel time from the Project

d) Shall be staffed during normal business hours (8am - 5pm) and shall include an answering service that will at all times direct the caller to a responsible person employed by the Developer who shall be available twenty-four (24) hours per day, three hundred sixty-five (365) days per year and assigned to coordinate the initial response to any Incident or Emergency.

e) TxDOT shall be entitled to access to the Developer's O&M Facility during normal business hours for the purpose of audit of Records upon reasonable notice.

f) Developer shall obtain and maintain all permits and approvals associated with Developer's Maintenance Facility.

19.2 Operations and Maintenance Limits

The O&M Limits shall be as initially shown in Table 19-2. Developer shall prepare Final O&M Limits drawings identifying Construction Period O&M Limits and Operating Period O&M Limits consistent with the requirements in Table 19-2 and Developer's Final Design. Approval. Updated O&M Limits drawings shall be submitted for TxDOT's Approval as part of the applicable MMP.

Table 19-2: O&M Limits

	O&M During Construction	**O&M After Substantial Completion**
New Harbor Bridge	Not Applicable	All areas consistent with the principles and extents identified in Attachment 19-4 (O&M Limits) for the New Harbor Bridge.

Roadway Section	All areas consistent with the principles and extents identified in Attachment 19-4 (O&M Limits) for the Roadway Section During Construction)	All areas consistent with the principles and extents identified in Attachment 19-4 (O&M Limits) for the Roadway Section After Substantial Completion)

The Roadway Section O&M Limits During Construction and after Substantial Completion shall include:

a) Mainlanes and all areas between the mainlanes and the limited access Project ROW boundaries;

b) Cross streets under the mainlanes, excluding interchanges: the O&M Limits shall include the bridge, including all substructure, drainage and foundations, and the area inside the mainlane limited access Project ROW.

c) Cross roads over the mainlanes: the O&M Limits shall include a vertical extension at the end of any approach slabs furthest from the bridge such that the approach slabs, the bridge, the roadway above, and all associated Elements are within the O&M Limits.

Developer shall be responsible for all O&M Work within these O&M Limits including Incident response.

19.3 Scope of O&M During Construction and O&M After Substantial Completion

O&M During Construction and O&M After Substantial Completion shall include O&M Work for all Elements within the O&M Limits, including: Routine Maintenance, Renewal Work and Operational Services unless noted otherwise in in Table 19-3. The Elements that are included within the O&M Work are the "Maintained Elements". Table 19-3 shall apply to O&M During Construction and to O&M After Substantial Completion.

Table 19-3 Excluded O&M Work and Maintained Elements

Element Category	**Element (Note 1)**	**X – Excluded from O&M Work**	
		New Harbor Bridge	**Roadway Section**
1) Roadway			
1.1	Obstructions and debris		
1.2	Pavement		
1.3	Crossovers and other paved areas		
1.4	Joints in concrete		
1.5	Curbs		
2) Drainage			
3) Structures			
4) Pavement Markings, Object Markers, Barrier Markers and Delineators			
5) Guardrails, Safety Barriers and Impact Attenuators			
6) Traffic Signs (Note 2)			
6.1	Non-gantry mounted signs	**X**	**X**
6.2	Gantry-mounted overhead signs		
7) Traffic Signals (Note 2)			
7.1	General	NA	**X**
7.2	Soundness	NA	**X**
7.3	Identification marking	NA	**X**
7.4	Pedestrian Elements and Vehicle Detectors	NA	**X**
8) Lighting			
8.1	Roadway and Aesthetic Lighting – General		

Element Category	Element (Note 1)	X – Excluded from O&M Work	
		New Harbor Bridge	Roadway Section
8.2	Sign Lighting		
8.3	Electrical Supply **(Note 3)**		
8.4	Access Panels		
8.5	High Mast Lighting	NA	
8.6	Navigational Lighting		
9) Fences, Soundwalls and Abatement			
9.1	Design and Location	NA	
9.2	Construction	NA	
10) Roadside Management			
11) Rest Areas and Picnic Areas		NA	NA
12) Earthworks, Embankments and Cuttings			
13) ITS Equipment			
14) Tolling Facilities and Buildings		NA	NA
15) Amenity		NA	NA
16) Snow and Ice Control			
17) Incident Response			
18) Customer Response			
18.1	Response to inquiries		
18.2	Customer contact line	**X**	**X**
19) Sweeping and Cleaning			

1) For the itemization of Elements within each Element Category, refer to the Performance and Measurement Baseline Tables.

2) TxDOT will perform maintenance of traffic signals and non-gantry-mounted traffic signs during the Construction Period and after Substantial Completion with the following exceptions. Whenever the Work requires a temporary traffic signal / sign, or modification of an existing traffic signal /sign (including modification of existing signal timings), Developer shall be responsible for the maintenance of such traffic signal/sign from the time of first installation or modification until: (a) in the case of D&C Work Final Acceptance; and (b) in the case of Renewal Work the completion of the applicable TMP and reinstatement of traffic to its original condition.

3) Responsibility for metered electricity supply costs is set forth in Section 19.10.2.

19.4 Performance Requirements

19.4.1 Application of Performance and Measurement Baseline Tables

Developer shall perform all activities necessary to satisfy the Performance Requirements set forth in the Performance and Measurement Tables (Attachments 19-1 through 19-3) for the Maintained Elements as shown in Table 19-4.

Table 19-4: Application of Performance Requirements

	O&M During Construction	O&M After Substantial Completion
New Harbor Bridge	Not Applicable	Performance Requirements as set forth in Attachment 19-1
Roadway Section	Performance Requirements as set forth in Attachment 19-2	Performance Requirements as set forth in Attachment 19-3

19.4.2 O&M During Construction

Developer's O&M During Construction responsibility is to maintain all Elements within the O&M Limits to a condition that meets or exceeds the Performance Requirements shown in Attachment 19-2 .

Developer shall cause the performance of inspections and / or tests to determine the condition of each Element (the "Baseline Inspections") and the preparation of the Baseline Element Condition Report (BECR).

Developer shall submit to TxDOT for Approval the proposed scope of Baseline Inspections, the methodology proposed for the inspections and/or tests and the name, relevant qualifications and experience of an organization financially independent of Developer that Developer proposes to undertake the Baseline Inspections and the BECR.

Upon TxDOT's Approval of the scope of the Baseline Inspections and the organization proposed by Developer to perform them, Developer shall provide to TxDOT a minimum of 14 Days' notice to witness the inspections and/or tests.

Developer shall cause the testing organization to prepare the BECR and shall submit to TxDOT for Approval as part of the MMP no later than 90 days prior to NTP2. The BECR shall include the following:

- A record of the condition of each Element shown in Attachment 19-8 (Baseline Inspection Requirements);
- Each photographic record and /or measurement shall be associated with a location accurate to the nearest 10 feet;
- The condition of each Element shall be recorded such that there is a minimum of one record for each Performance Section within which the Element is represented; and
- Where the condition of an Element varies within a Performance Section, the BECR shall include sufficient records to demonstrate the range of conditions and a reference condition for the Element shall be recorded for each Performance Section.

As part of the BECR, no later than 90 days prior to NTP 2, Developer shall include the location and condition of each Element (if any) that does not meet the applicable Target shown in Attachment 19-2. No later than 60 days prior to NTP2, Developer shall submit details of the Work that Developer considers would need to be carried out to cause each such Element to be in compliance with the applicable Target, including Developer's estimate of the cost of performing such Work. In the event that any Element does not meet the applicable Target, TxDOT may implement one or more of the following: (a) cause Elements to be in compliance with Targets using its own forces; (b) instruct Developer to perform Work that would enable Elements to be in compliance with applicable Targets; and (c) agree to a revision to certain Target(s) in Attachment 19-2 such that Elements are in compliance with the applicable Targets.

19.4.3 Updates of Performance and Measurement Baseline Tables

In the MMP, Developer shall set forth annually, for TxDOT Approval, updated Performance and Measurement Tables.

In its annual Submittals of the Performance and Measurement Tables, Developer shall propose for TxDOT's Approval any amendments to the "Response to Defects"; "Inspection and Measurement Method"; "Measurement Record and "Target" as are necessary to cause these to comply with Good Industry Practice and the Technical Provisions. TxDOT may, at any time, require Developer to adopt amendments to the columns with the headings "measurement record" and "inspection and measurement method" on the Maintenance Performance Requirements Baseline Table where such updates are required to comply with then current Good Industry Practice.

The Department shall require the adoption of a new Target only when this is required because the Inspection and Measurement Method or Measurement Record no longer complies with Good Industry Practice. In this case, the new Target shall be determined using the principle that it shall achieve no less than the standard of O&M Work that would have been achieved through Developer's compliance with the original Inspection and Measurement Method, Measurement Criteria and Target.

Developer shall provide updates to the Maintenance Performance Requirements Baseline Table to take into consideration specific attributes of the Final Design (for example, where the Final Design incorporates a feature that is not included as an Element in the Maintenance Performance Requirements Baseline Table).

Developer's updates to the Performance and Measurement Tables shall include the equipment manufacturer's recommended maintenance tasks at the manufacturer's recommended intervals, where applicable.

Within these Technical Provisions, reference to the Performance and Measurement Tables means the latest approved version of the Performance and Measurement Tables as included within Developer's MMP.

19.4.4 Categorization of Defects

Developer shall employ personnel who are trained to make the appropriate categorization of Defects and shall maintain a record of the circumstances of the Defect and how it was categorized.

Whenever a Defect is identified, Developer shall make a determination as to whether:

- it represents an immediate or imminent health or safety hazard to Users or road workers,
- there is a risk of immediate or imminent structural failure or deterioration,
- there is an immediate or imminent risk of damage to a third party's property, or
- there is an immediate or imminent risk of damage to the environment.

Should a Defect meet any of the above criteria, Developer shall record it as a Category 1 Defect (Hazard Mitigation) and take all necessary action to mitigate the Defect as described in this Section 19. Additionally, specific instances of Defects that shall be deemed to be Category 1 Defects are defined in this Section 19. Any other Defect not meeting the foregoing criteria shall be assigned as a Category 2 Defect. Developer shall take necessary action to avoid any Category 2 Defect from becoming a Category 1 Defect (Hazard Mitigation). Developer shall monitor Category 2 Defects to verify the condition of the affected Element prior to repair and shall inform TxDOT immediately should any such Defect deteriorate to a Category 1 Defect (Hazard Mitigation).

19.4.5 Obligation to Remedy and Repair

For Category 1 Defects, Developer shall take necessary action such that any hazard to Users is mitigated within the period specified in the column with the heading "Category 1 Hazard Mitigation" in the applicable Performance and Measurement Table and shall permanently remedy the Defect within the period identified in the column with the heading "Category 1 Permanent Remedy" in the applicable Performance and Measurement Table. Permanent Remedy, as defined and identified in the Performance and Measurement Table, shall be performed within the time period identified for the Permanent Remedy. Hazard Mitigation, as defined and identified in the applicable Performance and Measurement Table, shall be performed within the time period provided and shall continue until a Permanent Remedy is completed.

For Category 2 Defects, Developer shall undertake the permanent repair within the period specified in the column with the heading "Category 2 Permanent Repair" in the applicable Performance and Measurement Table unless an earlier repair is required to prevent deterioration to a Category 1 Defect (Hazard Mitigation).

Developer shall use the results of the inspections described in its MMP and other relevant information to determine, on an annual basis, the Residual Life of each Maintained Element within the O&M Limits and the scope necessary for the Rehabilitation Work Schedule.

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.

The remedy or repair of any Maintained Element shall meet or exceed the standard identified in the column entitled "Target" in the applicable Performance and Measurement Baseline Tables and a Maintenance Record shall be created by Developer to verify that this requirement has been met.

The period for 'Response To Defects' set forth in the Performance and Measurement Baseline Tables shall commence upon the earlier of: (i) the date and time the Developer became aware of the Defect; and (ii) the date and time the Developer should have known of the Defect.

Developer shall investigate reports and complaints on the condition of the Maintained Elements received from all sources. Developer shall record these as O&M Records together with details of all relevant inspections and actions taken in respect to Defects, including temporary protective measures and repairs. Where action is taken to remedy or repair any Defect in any Maintained Element, Developer shall create a Maintenance Record that identifies the nature of the remedy or repair. Developer shall include within the relevant Maintenance Record a measurement record compliant with the requirements set forth in the column entitled "Measurement Record" in the applicable Performance and Measurement Baseline Table.

Developer shall assign a cost to each Maintenance Record to allow TxDOT or Developer to interrogate Maintenance Records via the Maintenance Management System (MMS) to identify the cost of each repair.

19.5 Renewal Work Requirements

19.5.1 Obligation to perform Renewal Work

Developer shall promptly perform Renewal Work to renew, repair, or replace any Maintained Element when any of the following conditions occur:

(i) The Maintained Element is scheduled for replacement, rehabilitation or renewal in accordance with the O&M Work Schedule.

(ii) The condition of any Maintained Element is such that early replacement, rehabilitation or renewal is needed to enable Performance Requirements to be reliably achieved.

(iii) Defects have occurred or may be expected to occur on a frequent basis and there is a risk that Developer will be unable to comply with its obligation to remedy and repair such Defects within the applicable Defect Remedy Period as identified in Section 19.4.2 above.

(iv) Within any Performance Section, the minimum required Asset Condition Score is not achieved.

(v) The reliability is less than 99.7 percent for any safety-critical Element.

(vi) The reliability is less than 90 percent for any Element other than a safety-critical Element.

(vii) The Element ceases to function or dies (as in the case of plantings).

(viii) The frequency of repair is higher than that recommended in the manufacturer's preventive maintenance schedule.

The term "safety-critical" means that should an Element fail, the safe operation of the Project would be in jeopardy or an immediate or imminent safety hazard would result.

The term "reliability" as used in items 3 and 4 above shall be calculated as the in-service time measured over a moving 365-day period. For example, if an Element is out of service for 20 days of 365 days, its "reliability" is 94.5 percent (i.e., (365 – 20)/365 x 100 percent).

Whenever Renewal Work is performed that affects the New Harbor Bridge, Developer shall submit to TxDOT Record Drawings and supporting calculations and details. Prior to the expiry or earlier termination of any part of the O&M Work, Developer shall submit to TxDOT a complete set of Record Drawings and supporting calculations and details that accurately show all Renewal Work and any other changes to the Project during the performance of the O&M Services.

All Renewal Work shall follow the applicable design and construction requirements within the Technical Provisions as applicable to the original design, installation or construction unless such Technical Provisions have been superseded by Good Industry Practice. When an Element is renewed or replaced, and upon the first installation of the renewed or replaced Element into the Project, Developer shall not have the benefit of any Defect Remedy Period. Developer shall cause all Renewal Work to achieve the Target applicable to the Element as shown on the Performance and Measurement Table from the date that the renewed or replaced Element is incorporated into the Project.

19.5.2 O&M Work Schedule

Developer shall submit for TxDOT review and comment an O&M Work Schedule, which shall be provided separately for the New Harbor Bridge and the Roadway Section. The O&M Work Schedule shall include the timing, scope, and nature of Renewal Work that Developer proposes during each year for which Developer is responsible for O&M Work. The O&M Work Schedule shall set forth, by Maintained Element:

- The estimated Useful Life;
- The description of the Renewal Work anticipated to be performed at the end of the Maintained Element's Useful Life;
- A brief description of any Renewal 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.

Developer's first submittal and updates of the O&M Work Schedule shall be submitted at the same time as the submittal and updates of the applicable part of the MMP in accordance with Table 19-5.

Updates to the O&M Work Schedule shall be submitted for TxDOT's Approval and shall include a revised O&M Work Schedule for the upcoming year or, if Developer considers that no change is required, the then-existing O&M Work Schedule, accompanied by a written statement that Developer intends to continue in effect the then-existing O&M Work Schedule without revision for the upcoming year (in either case, referred to as the "updated O&M Work Schedule").

Developer shall make revisions to the O&M Work Schedule as reasonably required by experience and then-existing conditions respecting the Project, changes in technology, changes in Developer's planned means and methods of performing the Renewal Work, and other relevant factors. The updated O&M Work Schedule shall show the revisions, if any, to the prior O&M Work Schedule and include an explanation of reasons for revisions. If no revisions are proposed, Developer shall include, for each Maintained Element, a justification for why the prior O&M Work Schedule still applies.

19.6 Maintenance Management Plan

19.6.1 Maintenance Management Plan Submittal Requirements

The MMP is an umbrella document that describes Developer's managerial approach, strategy, and quality procedures for the O&M Work to achieve all requirements of the Contract Documents. Unless otherwise agreed by TxDOT, the MMP shall be consistent with the maintenance approach and preliminary MMP contained in Exhibit 2 to the Agreement as submitted with Proposal. The MMP shall include all aspects of the O&M Work including Routine Maintenance, Renewal Work and Operational Services.

Developer shall assign a Maintenance Manager who shall be responsible for implementing the maintenance obligations in this Section 19 and the Developer's MMP. Maintenance Manager shall ensure the O&M Work is performed in accordance with the Contract Documents including ensuring proper training of all maintenance personnel and resources available for conducting the O&M Work. The Maintenance Manager shall be responsible for the health and safety of personnel delivering the O&M Work and the general public affected by the Project and shall serve as the point of contact for Developer in communication with TxDOT and in coordination activities with other entities during Emergency events.

Developer shall submit the parts of the MMP to TxDOT for review and Approval by dates shown in Table 19-5.

Table 19-5 MMP Parts and Submittal Requirements

Part of MMP	First Submittal to TxDOT	Updates	Conditions
Roadway Section – O&M During Construction	No later than ninety (90) Days prior to the issuance of NTP2.		Approval by TxDOT shall be a condition to NTP2.
Roadway Section – O&M After Substantial Completion	No later than ninety (90) Days prior to Substantial Completion.	No later than 120 Days before each anniversary of the Initial Maintenance Term Commencement Date	Approval by TxDOT shall be a condition to Substantial Completion.
New Harbor Bridge – O&M After Substantial Completion	No later than ninety (90) Days prior to Substantial Completion.	No later than 120 Days before each anniversary of substantial Completion	Approval by TxDOT shall be a condition to Substantial Completion.
Existing Bridge and Approaches	No later than ninety (90) Days prior to the issuance of NTP3.		Approval by TxDOT shall be a condition to NTP3.

19.6.2 MMP General Requirements

The MMP shall be consistent with the general maintenance obligations described in Section 19.1 (General Requirements).

The MMP shall include:

(i) Processes and procedures that will be employed by Developer to meet the Performance Requirements, including response times to mitigate hazards, permanently remedy, and permanently repair Defects, the necessary inspection procedures and frequencies to address

Defects for each Maintained Element, including impacts to Related Transportation Facilities and the process for reliability and maintainability analysis.

(ii) Procedures and proposed cycle times for safety patrols, sweeping, litter pickup, and debris pickup on travel lanes within the O&M Limits.

(iii) The most recent approved versions of the applicable Performance and Measurement Tables. As part of an update of the MMP to be undertaken at least annually, Developer shall propose, for TXDOT's Approval, updates to the Performance and Measurement Tables in compliance with the requirements of Section 19.4.3.

(iv) Procedures for managing records of inspection and O&M Work, including appropriate measures for providing protected offsite backup(s) of all records.

(v) Schematic drawings showing the O&M Limits, and the limits of Performance Sections as described in Section 19.2.

(vi) Maintenance and service manuals including equipment manufacturer's recommended maintenance schedule and operating procedures in both printed and electronic file format (searchable PDF) to include technical maintenance and servicing descriptions for all major and safety critical components as well as equipment that is specialized to meet the needs of the Project. The manual shall include preventive maintenance schedules, testing and troubleshooting techniques, corrective measures, both temporary and permanent, the location and availability of support services, point to point component wiring schematics and logic signal flows, assembly and disassembly drawings, including exploded view drawings.

(vii) Standard service manuals for unmodified commercial products containing information necessary to properly service the specific equipment supplied in connection with the Project.

(viii) Spare parts, special tools and equipment list including an auditable parts and spares inventory adequate to address the maintenance obligations and compatible with the MMS as described in Section 19.6.10 and inventory control process and procedures and an updated list of vendors for equipment and maintenance services

(ix) Current versions and procedures, functionality, software maintenance requirements and access protocols for all specialist software employed by Developer in connection with the O&M Work including the Maintenance Management System (MMS).

(x) Developer's approach to maintenance requirements of the Existing Harbor Bridge following Substantial Completion of new Harbor Bridge through substantial completion of Phase 2 including Developer's approach to coordination with residents and businesses surrounding the Existing Harbor Bridge.

19.6.3 *O&M Work Deliverable Schedule*

Developer shall include an O&M Work Deliverable Schedule with the applicable part of the MMP.

The O&M Work Deliverable Schedule shall include all principal O&M Work, in sufficient detail to monitor and evaluate activities including maintenance and interfaces with other projects, third parties and Governmental Entities.

For each activity, Developer shall indicate: the duration (in Days) required to perform the activity, the anticipated beginning and completion date, the sequence of performance and the logical dependencies and inter-relationships among the activities.

Developer shall assign the WBS structure consistently and uniformly among all similar activity types in the O&M Work Deliverables Schedule and shall develop the WBS with clearly identifiable linkage to the Schedule activities.

The O&M Work Deliverable Schedule shall include a listing of all submittals as required by the Contract Documents. Submittal activity durations shall include specified durations for TxDOT review and/or Approval.

With the exception of activities relating to Environmental Approvals by Governmental Entities, each O&M work activity shall have duration of not more than 20 Days, and not less than one Day, except as otherwise approved by TxDOT.

Developer shall update the approved O&M work Deliverable Schedule to reflect the current status of the Project, including approved Change Orders or provide a notification of no change to the current schedule, as part of the Monthly Report. Each O&M work Deliverable Schedule update shall accurately reflect all activities as of the effective date of the updated schedule and shall include a schedule narrative report which describes the status of the O&M work in detail.

Developer shall submit a hardcopy of the schedule on full-size (11" x 17") color plot sheets, as well as an electronic version of the schedule in its native format for each submittal of the schedule along with a narrative.

19.6.4 Maintenance Document Management Plan

As part of the MMP, Developer shall establish and maintain a document management plan (the "O&M Work Document Management Plan") that includes an electronic document control system to store, catalog, and retrieve all O&M Records and other Project-related documents related to the O&M Work 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.

Maintenance Records (including records of inspections) shall be kept for the duration of Developer's responsibility for applicable O&M Work and shall be provided to TxDOT at the expiry or earlier termination of the applicable O&M Work as shown on Table 19-1. All records obtained during the Warranty Periods shall be kept and provided to TxDOT at the end of the last Warranty Period.

19.6.5 Communications Plan

As part of the MMP, Developer shall submit a comprehensive communications plan ("O&M Work Communications Plan") to TxDOT for Approval that is consistent with and expands upon the preliminary communications plan submitted with the Proposal.

The O&M Work Communications Plan shall describe the processes and procedures for communication of Project information between the Developer's organization, TxDOT, Governmental Entities and other agencies having jurisdiction over transportation facilities adjacent to the O&M Limits, and shall describe how the Developer's organization will respond to unexpected requests for information, communicate changes or revisions to necessary Developer personnel.

Developer shall maintain and update the Maintenance Communications Plan during the Term.

19.6.6 Maintenance Safety Plan

As part of the MMP, Developer shall submit to TxDOT for Approval a comprehensive safety plan ("Maintenance Safety Plan") that is consistent with and expands upon the preliminary Safety and Health Plan submitted with the Proposal. The Maintenance Safety Plan shall fully describe the Developer's policies, plans, training programs, and work site controls to ensure the health and safety of personnel involved in the O&M Work and the general public affected by the Project during the O&M work.

Developer'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 O&M Work, whether on or adjacent to the Project.

An O&M Work safety manager shall be assigned to the project. This position will not be considered Key Personnel. The O&M Work safety manager shall be responsible for carrying out the Developer's safety plan and all safety-related activities related to the O&M Work, including training and enforcement of safety operations. The safety manager shall have the authority to stop all work on the Project. Upon TxDOT's Approval, this position may be fulfilled by another employee of the Developer if the employee meets all qualification requirements and can be available on site to the extent needed to perform the level of oversight deemed necessary for the O&M being performed. Requirements include:

- Roadway construction and safety enforcement experience;
- Safety management experience for a project of similar scope and complexity;
- Ten (10) years of progressive safety experience, five years of which must be safety management experience on similar O&M projects;
- Designation, at or before the Effective Date, as a Construction Health and Safety Technician (CHST) by the Board of Certified Safety Professionals (BCSP), or designation as a Certified Safety & Health Official (CSHO), either of which may be substituted for two (2) years of safety management experience;
- Completion of the OSHA #500 course – Trainer Course in OSHA Standards for Construction;
- Training and current certification for CPR and First Aid; and
- Completion of the following training sponsored by an accredited agency:
    - Work zone traffic control
    - Flaggers in work zones.

Note: A project of "similar scope and complexity" includes any regionally significant highway project with multiple travel lanes and major interchanges, and a long-span bridge structure over a navigable waterway.

19.6.7 Hazardous Materials Management Plan

As part of the MMP, Developer shall prepare a Hazardous Materials Management Plan (HMMP) for the safe handling, storage, treatment and/or disposal of Hazardous Materials during the O&M Work, whether encountered at or brought onto the Project Site by the Developer, encountered or brought onto the Project site by a third party, or otherwise, during the O&M Work.

The HMMP shall provide the identification and contact information for designated responsible individuals in the management of Hazardous Materials, include procedures compliant with all applicable Environmental Laws and include, at a minimum:

- Procedures for updating Safety Data Sheets (SDS), per OSHA requirements, for all chemicals used on the Project for the Maintenance Term;
- Designated individuals responsible for implementation of the plan;
- Procedures for identifying and documenting potential contaminated sites which might impact Project development;
- Procedures for mitigation of contamination during the O&M Work;
- Procedures for developing a detailed Spill Response Plan for the Maintenance Term;

- Processes for training personnel for responding to and mitigating Incidents involving contamination or waste;
- Provisions for appropriate storage and disposal of all waste encountered or disposed of on the Project for the Maintenance Term;
- Provisions for a Hazardous Materials training module; and
- Procedures for preparing an Investigative Work Plan (IWP) and Site Investigative Report (SIR) in the event that Hazardous Materials are discovered during the O&M Work.

The HMMP shall include provisions for making all workers in connection with the O&M Work aware of and able to recognize the potential Hazardous Materials to which they may be exposed, limiting workers' exposure to Hazardous Materials with appropriate administrative and engineering controls, and providing all necessary personal protection equipment to protect workers from exposure. The HMMP shall require Developer to provide any personnel from other organizations who visit the Project in connection with the O&M Work with the appropriate personal protection equipment.

The HMMP shall require that all personnel of Developer-Related Entities handling Hazardous Materials in connection with the O&M Work be trained and certified at least to the minimum requirements established under the current guidelines of OSHA 1910.120 (HAZWOPER Training).

The HMMP shall include procedures for ensuring that all applicable certifications, licenses, authorizations and Governmental Approvals for Developer personnel handling Hazardous Materials are current and valid through the duration of the O&M Work.

19.6.8 Environmental Compliance and Mitigation Plan

As part of the MMP, Developer shall prepare an Environmental Compliance and Mitigation Plan (ECMP) to document and fully detail compliance strategies and procedures to be employed in accordance with the requirements of applicable Environmental Laws and Environmental Approvals in connection with the O&M Work. The ECMP shall provide, at a minimum:

- Procedures for maintaining the environmental commitments required to verify that any discharge from the Project into a sanitary sewer system complies with appropriate codes and standards of the sanitary sewer owner;
- Procedures for identifying and mitigating any potential traffic noise caused by conducting the O&M Work;
- Procedures for providing all other environmental monitoring within the Project area and submitting all necessary environmental documentation and monitoring reports to the appropriate Governmental Entities and, when applicable, to TxDOT, to the extent necessary to maintain compliance with applicable Environmental Approvals; and
- Procedures for training personnel to avoid or take appropriate action to minimize environmental impacts caused by conducting O&M Work.

Developer shall meet the environmental requirements of Section 4 of the Technical Provisions during the performance of Renewal Work.

19.6.9 Maintenance Management System

Developer shall implement a computer based Maintenance Management System (MMS), compatible with TxDOT MMS, to record inventory, Defects, failures, repairs, maintenance activities and inspections performed.

The MMS 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 MMS shall be configured to report O&M Work and Defects by TxDOT "function code" shown in Attachment 19-7, Maintained Element, reference marker, and unit of measurement, as the same are described in the MMS User Manual. The MMIS data shall be developed and maintained in a format that is directly transferable into the TxDOT MMS, further details of which may be found at:

http://onlinemanuals.txdot.gov/txdotmanuals/mmt/manual_notice.htm.

In the MMS, the information for bridges shall include National Bridge Inventory (NBI) sheets. The MMS shall be fully populated and operational prior to NTP2 and shall be kept updated and operational for the duration of the Agreement.

Developer shall record within the MMS all complaints/service requests and shall report weekly to TxDOT, on a format approved by TxDOT, information on any complaints or service requests received by the Developer. This information shall include:

- The date and time of the complaint;
- The location and nature of the problem;
- Injuries and police involvement, including agency, name and badge number;
- Who made the complaint; and
- Date and action taken to address the complaint.

Developer shall record within the MMS all accidents/Incidents. Developer shall report in writing to TxDOT, no later than the 15th of each calendar month on a format approved by TxDOT, information from the previous month on any accident or Incident related to Maintenance Services being performed by Developer or within a work zone, including:

- accidents involving Developer or any Subcontractor personnel, equipment, barricades or tools;
- traffic accidents within the limits or in the vicinity of any O&M Work being performed by Developer or any Subcontractors;
- accidents related to shipping or port commerce within the Project Limits;
- releases of Hazardous Materials;
- any accident involving Developer or Users that causes damage to any Project appurtenance, structure, improvement or fixture.
- with respect to any accident/Incident, the information provided shall include as a minimum:
    - The date and time of the accident/Incident;
    - The location of the problem;
    - The nature of the problem;
    - All parties involved in the Incident, including names, addresses, telephone numbers and their involvement (including witnesses);
    - Responsible party and insurance information;
    - Action taken to address the Incident; and
    - Documentation of traffic control in place at location.

The MMS shall be capable of reporting system performance on a geographical basis to demonstrate compliance with operational and maintenance requirements. The MMS shall incorporate a Geographical Information System (GIS), which shall use the same database engine as the MMS and shall use the MMS for display of physical Element information. Developer shall demonstrate, by comparing coordinates of a statistically valid selection of Elements in the GIS with coordinates obtained using an independent source of higher accuracy, that the horizontal and vertical locational accuracy of Elements recorded on the MMS complies with or exceeds Good Industry Practice. The information displayed geographically shall include pavement condition measurements, maintenance limits, average daily traffic and truck counts, and O&M Work performed by roadway segment. When a Maintained Element is constructed, installed, maintained, inspected, modified, replaced or removed, Developer shall update the MMS within three days of completion of such work. Defects shall be recorded on the MMS within 24 hours of coming to the attention of Developer. All other recording requirements shall be recorded on the MMS within 15 days of completion or occurrence of the relevant activity.

For the New Harbor Bridge, Developer shall cause all data associated with the description, location, maintenance condition and maintenance history of each Maintained Element as recorded within the MMS to be shared with the Bridge Information Model (BrIM) as described in Section 13.2.1.20, such that the MMS and the BrIM record consistent inventory and maintenance data for each Maintained Element.

The MMS shall be fully populated and operational prior to the commencement of O&M During Construction and kept updated and operational for the duration of the Term. Developer shall provide equipment, facilities and training necessary to permit remote, real-time, dedicated high-speed web enabled and password protected secure access to the MMS for up to six simultaneous TxDOT employees. All records entered into the MMS in relation to the Project shall be maintained and preserved during the Term. At TxDOT's sole discretion, Developer shall deliver the MMS and everything required for its operation to TxDOT, or shall deliver all electronic data kept in the MMS during the Term, in relation to the Project, in a format compatible with the Department's, or other entity's, MMS in use at the end of the Term.

19.6.10 Operations Plan

Requirements for the Operations Plan are set forth in Section 19.10.

19.7 O&M Work Quality Management Plan

19.7.1 General Requirements

As part of the MMP and within the time periods set forth in Table 19-5 for the relevant part of the MMP, Developer shall submit a quality management plan ("O&M Work QMP") to TxDOT for Approval that is consistent with and expands upon the preliminary Quality Management Plan submitted with the Proposal and complies with the requirements of Section 2.2 (Quality Management Plan). The O&M Work QMP shall contain processes and procedures to validate the completeness and accuracy of data, reports, and other information in connection with the O&M Work, to verify compliance with the Technical Provisions, to record and act upon nonconformances and to establish revised processes and procedures that will prevent recurrence of nonconformances and ensure continuous improvement in the performance of the O&M Work.

19.7.2 Quality Management of Renewal Work

Renewal Work shall be conducted in compliance with the Professional Services Quality Management Plan (PSQMP) described in Section 2.2.7 and the Construction Quality Management Plan (CQMP) described in Section 2.2.8. If Renewal Work is of a nature that in TxDOT's sole discretion requires independent construction quality acceptance, the Developer shall employ an independent organization having the appropriate qualifications to fulfill the duties assigned to the CQAF.

19.7.3 O&M Work QMP Requirements

The O&M Work QMP shall contain:

(i) processes and procedures to verify Developer's compliance with the Performance Requirements including frequency of checks / audits and assignment of responsibility for performing;

(ii) processes and procedures to validate the accuracy of all O&M Records including frequency of checks / audits and assignment of responsibility for performing;

(iii) processes and procedures to validate the data, times, dates and other information entered into the Noncompliance Event database described in Section 13 of the CDA including frequency of checks / audits and assignment of responsibility for performing;

(iv) assignment of responsibility for daily field inspections of completed O&M Work and for preparing daily reports to document all inspections performed; and

(v) O&M quality management organization and staffing plan showing the period of time that each quality management staff member will be present on the site, the resumes of the Key Personnel and the experience/knowledge/skill levels required for the quality management support staff.

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

Maintenance QC Manager shall be responsible to see the methods and procedures contained in approved O&M Work QMP are implemented and followed by Developer and subcontractors in the performance of the O&M Work.

19.7.4 Personnel and Staffing

Maintenance QC Manager

Developer shall assign an on-site Maintenance QC Manager who shall be responsible for management of all quality aspects of the O&M Work and the production and update of the O&M Work QMP. The Maintenance QC Manager shall not be involved with scheduling or production activities, and shall report directly to Developer's management team. The Maintenance QC Manager is responsible for independently overseeing and performing quality management for the O&M Work. The Maintenance QC Manager shall report, develop and implement corrective actions for any deviations to the methods and procedures contained in the approved O&M Work QMP.

19.8 Maintenance Transition Plan

No later than 60 days prior to the expiry of any parts of the O&M Work for which Developer is responsible, or upon earlier termination, Developer shall submit a comprehensive Maintenance Transition Plan to TxDOT which includes the following items:

- Maintenance Transition punch list;
- List and status of equipment Warranties;
- Vendors' test reports;
- Developer's test reports;

- As-built drawings for Renewal Work;
- Maintenance Records (including NBIS records);
- Copies of Warranty and service contracts; and
- List of spare parts purchased as part of the Maintenance Services

Developer shall coordinate the identification of Maintenance Transition punch list items required to be completed by Developer 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. Developer shall be responsible to prepare (in conjunction with TxDOT), administer and complete all items on the Maintenance Transition punch list to the satisfaction of TxDOT prior to the transfer of maintenance responsibilities to TxDOT. Any spare parts intended for use in connection with the Project and in the possession of the Developer at the expiry of the Developer's responsibility for the relevant O&M Work shall be handed over to TxDOT.

Developer shall coordinate with TxDOT to achieve a smooth transition of O&M Work from and to TxDOT.

19.9 Inspections

19.9.1 *General Inspections*

Developer shall establish inspection procedures and frequency as well as a plan to implement a program of inspections necessary for the O&M Work and shall show all such inspections within the O&M Work Deliverables Schedule. All inspections for the New Harbor Bridge shall be performed in accordance with the Maintenance and Inspection Manual for the New Harbor Bridge as described in Section 13.2.1 of the Technical Provisions.

Inspection procedures shall:

- verify the continuing safety of the Project for Users;
- prioritize the necessary inspections to promptly identify and record Category 1 Defects;
- ensure 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 the Performance and Measurement Tables;
- ensure that all Category 1 Defects are identified and permanently remedied within the period given in the column entitled "Category 1 Permanent Remedy" in the Performance and Measurement Tables;
- identify Category 2 Defects to be included for repair either within Developer's annually recurring highway maintenance and repair program or as Renewal Work;
- ensure that all Category 2 Defects are identified and permanently repaired within the period given in the column entitled "Category 2 Permanent Repair" in the Performance and Measurement Tables;
- respond to reports or complaints received from Customer Groups;
- take into account and adjust for Incidents and Emergencies affecting the Project; and
- take into consideration data to monitor performance of the Project and to establish priorities for future maintenance operations and Renewal Work.

In performing inspections to identify Category 1 and Category 2 Defects, Developer 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 the Performance and Measurement Tables. Developer shall employ only trained personnel for the purpose of such inspections, capable of accurately categorizing and recording Defects in accordance with the requirements of Section 19.4.4.

Developer shall perform General Inspections in accordance with the MMP so that the repairs of all Defects are included in planned programs of work.

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

19.9.2 Specialist Inspections

Developer 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. Inspections, reviews, and testing performed in respect of O&M Work 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".)

Developer shall undertake Specialist Inspections for Maintained Elements listed in Table 19-6 and shall include the inspection results as O&M Records.

Table 19-6 – Specialist Inspections by Developer

Maintained Element	Specialist Inspection by Developer
All Maintained Elements in Element Category 'Roadway' in the Performance and Measurement Tables	Annual survey of pavement condition for all main lanes, ramps, and frontage roads within the O&M Limits, 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. For the Pavement Condition Score calculation as required by Element 1.2 of Attachment 1, the Developer shall perform all inspections and provide all data including distress types as required by TXDOT's Pavement Management Information system Rater's Manual. TXDOT will utilize these data to determine a Pavement Condition Score which will be provided to Developer for determination of compliance with the Performance Requirement for Element 1.2 and for use in the calculation of the Asset Condition Score.
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 Contract Documents. An updated load rating will only be needed if the structural system changes.
Pavement Markings for all lane lines, edge lines, centerline/no passing barrier-line	Annual Mobile Retroreflectivity Data Collection (MRDC) 60 days before the first anniversary of NTP2 and each year thereafter during the period of performance of O&M Work in

	accordance with Special Specification 8094 Mobile Retroreflectivity Data Collection for Pavement Markings.

19.9.3 Routine Biennial Inspections of New Harbor Bridge

In addition to inspections being performed by Developer, TxDOT will conduct routine biennial inspections of the New Harbor Bridge in compliance with the latest FHWA / NBIS and TxDOT requirements. The results of all routine biennial inspections will be made available to Developer upon their completion.

Developer is responsible for the provision of an access system compliant with Section 13.2.1.19. The access system shall comply with the following:

- Available for TxDOT sole use upon request by TxDOT providing at least thirty days' notice to Developer for TxDOT's performance of the routine biennial inspection;
- Available for TxDOT immediate sole use in the event of an Emergency, or when a condition exists which at TxDOT's sole discretion requires immediate attention;
- Available for TxDOT's sole use for the day-time periods necessary to conduct the biennial bridge inspection, but in any case on no less than sixty daytime 8-hour periods per year;
- During any periods that TxDOT has sole use of the equipment, Developer shall provide trained personnel to safely operate the equipment to enable access to any part of the structure in accordance with instructions provided by TxDOT employees or agents;
- During such periods, Developer shall be solely responsible for provision of access;
- Any damage to the Project that may be caused by the operation of the equipment is entirely Developer's risk; and
- For an under-bridge inspection vehicle to be the sole acceptable means of access, Developer's access plan must demonstrate to TxDOT's reasonable satisfaction that the biennial inspection is capable of being performed using such vehicle over a period of no more than fourteen daytime 8-hour shifts.

Using the results of the routine biennial inspections and other available sources, Developer shall determine the condition of all Elements of the New Harbor Bridge and shall identify structural and non-structural deficiencies. Developer shall not rely upon TxDOT for inspections or information required for performance of the O&M Work.

No later than 90 days after receipt of the routine biennial inspection, Developer shall prepare a condition survey report for TXDOT's Approval that provides details of all recommended repairs for each Element, using the definitions of condition and terminology as defined in the MMS and the original contract drawings identification system.

19.9.4 Inspection of Access Systems

Developer shall be responsible for regular inspection of all access systems including maintenance travelers. All such inspections shall be performed in accordance with the manufacturer's instructions and the maintenance and inspection manual described in Section 13.2.1.19.2. All inspection records shall be immediately available to TxDOT upon request. Any certificates of inspection and testing required in connection with access systems shall be prominently displayed on the applicable access system.

19.9.5 Bridges / Structures Inspections Requirements for Roadway Section

Developer shall be responsible for conducting bridge inspections on all the bridges within the O&M Limits for the Roadway Section and shall request TxDOT Approval for all Bridge Inspection Team Leaders, Bridge Inspection Supervisors, and the approving Professional Engineer a minimum of 60 days before initiating the bridge inspections.

Developer shall inspect all bridges within the Roadway Section according to the frequencies and criteria required by the Code of Federal Regulations. Developer shall create inspection reports in accordance with TxDOT's procedures and shall furnish TxDOT an original signed and sealed bridge inspection report and a color copy within 60 days after completion of each inspection.

Developer shall maintain all bridge records at all times in preparation for audit reviews. Developer shall ensure that bridge inspectors attend appropriate bridge inspection training courses and are certified to conduct bridge inspections. TxDOT will perform quality assurance reviews by inspecting bridges that have been previously inspected by Developer and by reviewing the inspection records for conformity with TxDOT's findings.

19.9.6 Special Bridge Inspections

Special Bridge Inspections are defined as inspections of Elements for which testing, special tools or equipment is necessary. Developer shall identify the need for Special Bridge Inspections following its receipt of the routine biennial inspection report, or when non-typical conditions of any bridge Element or system are identified. This shall include whenever a Defect or structural condition exists which may give rise to a structural failure, or whenever a structural condition exists or is suspected which, by reason of loading, deflection, allowable stress or other factor, may have invalidated or exceeded the original design basis of any Element. Developer shall be responsible for the performance of Special Bridge Inspections whenever Elements cannot be fully inspected by other methods of inspection contemplated for the routine biennial inspections. Developer shall submit results of all Special Inspections to TxDOT within thirty (30) days of completion.

19.9.7 Developer Performance Inspections

Developer shall undertake Performance Inspections of Performance Sections randomly selected by TxDOT for audit purposes at least once every six months. Performance Inspections shall be undertaken for O&M During Construction and for O&M After Substantial Completion. . Performance Sections for the Roadway Section shall consist of all travel lanes including mainlanes, shoulders, ramps and frontage roads operating in one direction over a length of approximately 0.1 mile, together with all Elements of the Project within the O&M Limits associated with the 0.1 mile length of roadway.

Developer shall establish Performance Sections referenced to the Texas Reference Marker System. Developer shall establish and prepare plans identifying the Performance Sections. The plans shall identify the boundaries of each Performance Section and shall cross reference to an inventory describing each Element within the O&M Limits contained within each Performance Section. Developer shall submit and update these plans with the applicable part of the MMP. Performance Sections for the Roadway Section shall be defined separately for O&M During Construction and for O&M After Substantial Completion.

For the New Harbor Bridge there shall be four (4) equal length Performance Sections (two in each direction of travel) encompassing all Maintained Elements associated with the New Harbor Bridge. For the Roadway Section, TxDOT will select 10% of the available Performance Sections to be subject to Performance Inspections every six (6) months such that over a period of five (5) years the Performance Inspections provide coverage of 100% of the Roadway Section. For the New Harbor Bridge, one Performance Section shall be subject to Performance Inspection every six months. Developer 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.

Developer shall create a new O&M Record for each Maintained Element physically inspected in accordance with the column entitled "Measurement Record" on the Performance and Measurement Tables. Performance Inspections shall be undertaken to a schedule agreed with TxDOT. TxDOT shall be given the opportunity by seven days' notice, to accompany Developer when it undertakes the physical inspections associated with the Performance Inspections.

19.9.8 *Asset Condition Score*

Developer shall report the Asset Condition Score according to the method described in this Section 19.9.8. The Asset Condition Score records the condition of the Maintained Elements at the date of each Performance Inspection. Developer shall achieve the minimum Asset Condition Score set forth in this Section 19.9.8, otherwise Noncompliance Points may be assessed as set forth in Exhibit 24 to the Agreement.

No later than ten days following the most recent Performance Inspections, Developer shall use the results to report the Asset Condition Score. The reporting requirements and the minimum required Asset Condition Score are set forth in Table 19-6.

Table 19-7 – Asset Condition Score Reporting and Minimum Requirements

Asset Condition Score to be reported	Definition	Minimum Required Asset Condition Score		
		O&M During Construction	O&M After Substantial Completion	
		O&M Limits	New Harbor Bridge	Roadway Section
Raw Asset Condition Score	For all of the Performance Sections assessed in the Performance Audit, the Asset Condition Score for each measurement record, calculated in accordance with Table 19-8	N/A	N/A	N/A
Element Category Asset Condition Score	Weighted mean of the Raw Asset Condition Scores for each measurement record reported separately for each Element Category	N/A	Minimum 3.5 Calculated in accordance with Attachment 19-5	Minimum 3.5 Calculated in accordance with Attachment 19-6
Aggregated Asset Condition Score	Weighted mean of the Raw Asset Condition Scores for each measurement record reported as a single number across all Element Categories			

Where a measurement record relates to a service measured over time or an Element that is not represented in more than 25% of Performance Sections then the Asset Condition Score for those measurement records will be based on a calculation taking into consideration the condition of all instances of the Element throughout the O&M Limits.

The Element Category Asset Condition Score shall be reported to 1 (one) decimal point.

The measurement records that are subject to inspection and scoring to calculate the Asset Condition Score, the weighting factors to be applied to individual measurement records and examples of the calculation of the mean Asset Condition Score are contained in the following attachments:

- For the New Harbor Bridge, as shown in Attachment 19-5
- For the Roadway Section for O&M After Substantial Completion, as shown in Attachment 19-6

Developer shall report the Raw Asset Condition Score for each applicable measurement record using the criteria set forth in Table 19-8.

Table 19-8 – Raw Asset Condition Score Criteria for Measurement Records (Reported once every six months for all inspected Performance Sections)

Score	Raw Asset Condition Score Criteria

5	• Targets for individual measurement records are almost entirely met (90% to 100% compliance with the relevant Target for each measurement record for all inspected Performance Sections), and • Is fully functional and in nearly new condition, meeting or exceeding Performance Requirement.
4	• Targets for individual measurement records are substantially met (less than 90% compliance and 80% or greater compliance with the relevant Target for each measurement records for all inspected Performance Sections), and • Is functional and in good condition, meeting Performance Requirement.
3	• Targets for individual measurement records are mostly met (less than 80% compliance and 70% or greater compliance with the relevant Target for each measurement record for all inspected Performance Sections), 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 measurement records are barely met (less than 70% compliance and 60% or greater compliance with the relevant Targets for each measurement record for all inspected Performance Sections), 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 measurement records are not met (less than 60% compliance with the relevant Target for each measurement record for all inspected Performance Sections), or • In very poor condition demonstrating need for immediate replacement, renewal or repair of individual Element and/or immediate change to MMP.

19.10 Operational Services

19.10.1 Operational Services General

This Section 19.10 sets forth Developer requirements for Operational Services which are part of the O&M Work. As part of the MMP, Developer shall prepare an Operations Management Plan (OMP) which shall include Developer's approach and procedures for:

(i) Employment and training of competent personnel to carry out all aspects of the OMP
(ii) Monitoring operational performance of the Project;
(iii) Incident response, management and reporting;
(iv) Traffic operations restrictions, including ensuring compliance with periods of lane closure restrictions;
(v) Standard operating and communication procedures for Emergency preparation, response, and
(vi) recovery, including impacts from extreme weather conditions;
(vii) Planning and coordination with all affected Governmental Entities, including Emergency Services;
(viii) Analysis of vehicular accident patterns to identify safety issues and implement cost effective solutions to maximize safety;
(ix) Corridor management including coordination of activities of other entities with interests within the O&M Limits and Related Transportation Facilities;

(x) [Coordination with TxDOT and other entities during ITS integration and ITS operations.];
(xi) Liaison with any Traffic Management Centers that TxDOT or other entities may establish
(xii) Patrolling the Project;
(xiii) Coordinating policing of the Project; and
(xiv) Prompt investigation of reports or complaints received from all sources.

19.10.2 Metered Utility Consumption Costs

The following Table 19-9 sets forth the responsibilities for metered utility consumption costs.

Table 19-9 – Responsibility for Metered Utility Consumption Cost

	Metered Utility consumption cost to be paid direct to Utility by	
	Between NTP2 and Substantial Completion	After Substantial Completion
Roadway lighting	Developer	Developer
Architectural lighting on New Harbor Bridge	Developer	Developer
Sign lighting	Developer	Developer
Security and pedestrian lighting	Developer	Developer
Traffic signals	TxDOT	TxDOT

19.10.2.3 Other Metered Utility Costs

Developer is responsible for all other metered consumption costs charged by utilities in connection with the O&M Work, including any such costs to operate Developer's Maintenance Facility, office facilities, or other similar facilities under Developer's control during construction and throughout the period for which Developer is responsible for O&M Work.

19.10.3 Incident Detection and Response Compliance

When Developer is made aware of an Incident within the O&M Limits by TxDOT, a Governmental Entity or the Emergency Services or when Developer becomes aware of an Incident through its own forces, Developer shall respond to the Incident and provide assistance to Emergency Services and appropriate Governmental Entities to protect the safety of Users. This shall include response on short notice to attend the site of Incidents such as accidents, highway spills, disabled vehicles and other miscellaneous events affecting the flow of traffic, and the removal and disposal of debris from the highway lanes and shoulders including any object that is not normally intended to be on the roadway and may create hazardous conditions for Users such as vehicle cargo, tires; tire debris; vehicle parts; animals; or other objects that may affect amenity of the roadway or impact normal driving.

When Developer is aware of an Incident within the O&M Limits, Developer shall be responsible for proceeding to the Incident site to secure the site and shall provide assistance as required by TxDOT, the applicable Governmental Entity or the Emergency Services. Developer shall take all action required to keep Users, adjacent landowner(s), and Developer's staff safe.

Developer shall detect and respond to all traffic- or roadway-related Incidents within the O&M Limits within the time period specified in the applicable Performance and Measurement Table. The time period

for Incident response shall commence when Developer becomes aware of an Incident and shall end when Developer has completed the appropriate response steps for the Incident, as detailed by the Incident response procedures contained in the MMP. These steps shall include all required notifications, traffic, and facility control systems activations and the arrival on the scene of the Incident of appropriate equipment and personnel from Developer's field response team. Developer shall log and record the sequence of all actions taken in response to the Incident.

Failure by Developer to comply with the requirements of this Section 19.10.3 or with the Incident response protocols in the MMP shall be a Category 1 Defect (Hazard Mitigation).

19.10.4 Roadway Reopening Time Policy Compliance

For any Incident or Emergency within the O&M Limits that requires Developer's action to reopen lane(s), Developer shall be required to reopen the lane(s) within the time period specified in the applicable Performance and Measurement Tables, after the Emergency Services has returned operational control to Developer.

As a minimum, Developer shall provide the following equipment to attend at Incidents and Emergencies:

(i) A support vehicle equipped with traffic control devices to provide a temporary lane closure at the site of the Incident/Emergency;
(ii) Equipment to enable the inspection of Elements that may have been damaged during the Incident/Emergency;
(iii) Equipment for collection, containment and transportation of hazardous material; and
(iv) Equipment for heavy towing where the Incident/Emergency involves a vehicle larger than a family sized car.

Where heavy towing is required, Developer shall cause the attendance at the site of the Incident of personnel having previous experience and knowledge in working with heavy duty towing and recovery efforts and who are proficient and trained in the safe use of the equipment.

Refer to the Performance and Measurement Table for response times where Emergencies or Incidents within the O&M Limits require heavy towing equipment to be mobilized by Developer .

19.10.5 Incident Management Plan

Developer shall prepare an Incident Management Plan (IMP) as part of the MMP.
The IMP shall contain Developer's approach, training requirements, staffing requirements and procedures for response to Incidents and Emergencies, and shall include protocols, procedures, and guidelines to mitigate the impacts, and respond to and recover from all such
events. Developer shall prepare the IMP and its subcomponents in coordination with
and input from TxDOT, Emergency Services, owners of Related Transportation Facilities and applicable Governmental Entities. The IMP shall be updated as necessary to include procedures and protocols for addressing Incidents and Emergencies after Substantial Completion.

The IMP shall include:

(i) Procedures to identify Incidents and notify Emergency Services providers and establish traffic control for Incident management activities in a timely manner;
(ii) [Procedures for removal of stalled, broken down, wrecked or otherwise incapacitated vehicles from the travel lane, including coordination with Emergency Services/law enforcement];

(iii) Procedures to provide the required response times by Developer and all measures to be instituted by Developer to clear the Incident and return lane availability within the specified period of arriving at the Incident site;

(iv) Procedures for cleanup of debris, oil, broken glass, etc. and other such objects foreign to the roadway surface;

(v) Procedures to communicate IMP information to Developer's public information personnel and notify the public of traffic issues related to Incidents;

(vi) Descriptions of contact methods, personnel available, and response times for any Emergency condition requiring attention during off-hours;

(vii) Procedures to improve processes and procedures after incidents have occurred to improve the process, response time and roles and responsibilities.

19.10.6 Policing

Developer shall coordinate Project policing requirements with the appropriate law enforcement agencies to provide a level of policing consistent with that provided on other similar facilities.
Should Developer require additional policing over and above this level, Developer shall be responsible for negotiating this additional service at no additional cost to TxDOT.

19.10.7 Response to Adverse Weather

Developer shall report highway and weather conditions to TxDOT every morning by 8:15 a.m. and update the information as needed to TxDOT and include this information on the Developer's Web page.

The following types of information are to be reported:

- Highway conditions which close travel in one direction for more than four hours or create hazardous travel including construction or maintenance sites, roadway or right of way damage, major accidents or hazardous spills; and
- Weather-related events which may cause unsafe driving conditions such as ice, sleet, snow, floods, or high winds.

All hazardous weather conditions shall be assessed as a Category 1 Defect (Hazard Mitigation) and shall be addressed immediately by Developer upon detection or upon being informed of the condition(s). Developer shall use available resources to assess weather conditions and make decisions and direct actions that maintain the roadway in as safe as possible a condition during winter events. Developer shall use the full complement of available resources to keep the roadway as safe as possible throughout winter events.

Developer shall prepare and implement a Snow and Ice Control Plan (SICP) that contains detailed operational procedures for performing snow and ice control work within the O&M Limits for O&M During Construction and O&M After Substantial Completion. The SICP shall comply with all applicable Law, codes, and regulations governing the operation of equipment on public highways.

The SICP shall address the following:

(i) Advance preparation procedures

(ii) Call-out procedures

(iii) Response protocol

(iv) Operational requirements

(v) Training
(vi) Recordkeeping/Reporting
(vii) Environmental management
(viii) Anti-icing and de-icing chemical storage
(ix) Anti-icing and de-icing materials, including salt and alternative substances
(x) Equipment.

Developer shall annually update and submit the SICP to TxDOT for its review and Approval in its good faith discretion prior to July 30 each year, and shall incorporate any changes in strategy, equipment levels, etc., designed to rectify faults identified by Developer, and TxDOT in Developer's snow and ice removal operations during the preceding winter season.

19.10.8 Oversize / Overweight Permits

Developer shall be responsible for analyzing overweight load permit applications from the Texas Department of Motor Vehicles (TxDMV). Refer to: http://www.txdmv.gov/motor-carriers/oversize-overweight-permits for a description of permit types. Notification of an overweight load permit application will come from and response shall be returned to TxDMV. Developer shall respond to each overweight load permit request within 7 days. Permit analysis shall be performed according to the AASHTO Manual for Bridge Evaluation.

19.11 Traffic Control for O&M Work

Traffic control for O&M Work shall be governed by Section 18.

19.11.1 Public Information and Communications

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

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

Developer shall meet the requirements of Section 3 of the Technical Provisions during the performance of Renewal Work activities.

19.12 Reporting Requirements

19.12.1 Reporting and Books and Records

Developer shall, in accordance with Section 13.2.1 of the Agreement, deliver a quarterly Operations Report to TxDOT for its records, all in accordance with the Contract Documents and quality management system. TxDOT will perform audits of work throughout O&M During Construction and O&M After Substantial Completion using sources such as logs, activities, and the recordkeeping efforts of Developer to ensure compliance. The Operations Report shall include a high-level summary of Noncompliance Events, Unavailability Events and Noncompliance Point assessments. The report shall also include, in an organized and readable format, all of the supporting information and detailed data necessary to confirm the occurrence of any Noncompliance Events, Unavailability Events and any Defects or other occurrences that result in Noncompliance Point assessments. See Section 20.5 of the Agreement for additional requirements regarding Developer Books and Records and TxDOT audits.

19.12.2 Quarterly Maintenance Work Report

The Maintenance Work Report shall identify all of the Planned Maintenance and Renewal Work for the period, the actual Work performed for the period, and confirmation that all Work performed was in compliance with the MMP. The Maintenance Work Report shall be submitted quarterly and shall be broken down for each month of the quarter.

Maintenance Work Report shall include the following data and information:

(i) Summary of the Planned Maintenance and Renewal Work for each month of the quarter.

(ii) Summary of the Planned Maintenance and Renewal Work performed and completed for the month.

(iii) Summary of the Planned Maintenance and Renewal Work that was not completed for the month. This report shall include reasons for not performing any Planned Maintenance or Renewal Work when it was originally scheduled.

(iv) Summary of the maintenance activities performed for the month beyond the Planned Maintenance and Renewal Work, such as unplanned maintenance and repairs.

(v) Detailed results of all Planned Maintenance and Renewal Work and other maintenance work that was performed during the month.

(vi) Summary of Planned Maintenance Closures for the coming month. This report shall include details describing the location, duration, and reason of each.

(vii) Detailed results of all inspections, assessments, and testing activities, including the procedures, forms, etc.

(viii) Equipment Out-of-Service Report. This report shall list all traffic control and traffic surveillance, mechanical, and electrical equipment that was not functional at some time during the month and include data such as durations, reasons, and cross-references to any events or Incidents that may be related to the out-of-service equipment.

(ix) Quality assurance review of all maintenance personnel actions, lessons learned, etc.

(x) Summary of staff and hours worked for the month.

(xi) A listing of all assets in the operation and maintenance program, including individual equipment and assets, with a summary of all of the maintenance activities performed during the month and the complete history of maintenance for the asset as reported by the MMS.

19.12.3 Quarterly Operations Report

The quarterly Operations Report shall identify all of the Defects, Incidents, accidents, Incident response times, operations logs, service requests, severe weather Incidents, and security Incidents that occur over the preceding quarter. The reports shall include a system for referencing each activity/event and the time and date of commencement and date of resolution.

Quarterly Operations Report shall include the following data and information:

(i) Summary of the status of all parts of the Project for which Developer is responsible for O&M Work for the month identifying all Closures, Permitted Closures, and Unavailability Events as defined by the Agreement.

(ii) Non-Conformance Reports: For each Defect, the report shall identify the location, the nature and cause of the Defect and the steps that will be, or have been, taken to address the Defect.

(iii) O&M Contractor event log data, including all operator actions and event details for traffic and systems events, Incidents, security Incidents, weather Incidents, and the details of Developer's Incident response, including response time data, response records, etc.

(iv) Developer's Incident response logs, including a time-based report of all actions and activities performed by Developer.

(v) Quality assurance review of the O&M Contractor actions and lessons learned where appropriate.

(vi) Summary of staff and hours worked for the month.

(vii) Summary of Closures, Permitted Closures, and Planned Maintenance hours for the coming month. This report shall include details describing the location, duration, and reason of each.

19.12.4 Annual Report

Developer shall submit an annual report to TxDOT by each anniversary of the commencement of O&M Work. This annual report shall include the following elements:

- A description of the O&M Work performed versus the planned goals established in the MMP, as well as corrective actions and measures to be taken in the ensuing year to ensure that any shortcomings are corrected;
- An assessment of compliance with the traffic control requirements and limitations and the traffic control plans, as well as any corrective measures taken to correct any breach or violation of such requirements and limitations and any corrective measures necessary to prevent such future breach or violation of such requirement and limitations;
- A report of the quality inspections and tests performed, the results of such inspections and tests, and occurrences and the measures taken to correct Nonconforming Work.

19.13 Additional Requirements

19.13.1 Rail

Developer shall coordinate the O&M Work with the operating railroad and shall be responsible for obtaining the required Approvals, permits, and agreements as required for the O&M Work, including any railroad related maintenance activities in accordance with Section 14.

19.13.2 Landscaping

Refer to Section 15.3 for Developer's responsibilities regarding O&M Work for planting.

19.14 Handback Requirements

19.14.1 General

Developer shall cause the New Harbor Bridge and the Roadway Section to meet the requirements of this Section 19.14 so that, at the Termination Date, the specified Residual Life for each applicable Element shall be met or exceeded. Renewal Work as identified in the initial Handback Inspection (see Section 19.14.4 below) to enable any Element to meet or exceed the minimum Residual Life specified in this Section 19.14 shall be completed no later than 18 months before the end of the O&M Period.

19.14.2 Handback Plan

Developer shall prepare a Handback Plan that contains the methodologies and activities to be undertaken or employed to meet the Handback Requirements at the end of the O&M Period. The Handback Plan shall be presented in two parts: (a) for the New Harbor Bridge and (b) for the Roadway Section. Developer shall submit the Handback Plan, including a Residual Life Methodology plan, to TxDOT for review and Approval at least 60 months before the end of the O&M Period.

Residual Life Requirements, defining the number of years of Residual Life for each Element at the end of the O&M Period are as follows:

- For the New Harbor Bridge, as shown on Table 19-10
- For the Roadway Section as shown on Table 19-11

For any Element of the Project for which a "Required Final Residual Life" is not specified in Table 19-10 or Table 19-10, the required Residual Life for the Element shall equal the documented Useful Life of the Element or five (5) years, whichever is less.

Developer shall perform an initial, an intermediate, and a final Residual Life Inspection that covers all physical Elements within the Project as noted below. Within thirty (30) Days following performance of each Residual Life Inspection, Developer shall submit to TxDOT the findings of the inspection, Residual Life test results and Residual Life calculations.

The Handback Plan shall contain the evaluation and calculation criteria to be adopted for the calculation of the Residual Life at Handback for all Elements of the Project (the "Residual Life Methodology"). The scope of any Residual Life testing shall be included, together with a list of all independent Residual Life testing organizations, proposed by Developer. These organizations shall be on TxDOT's approved list at the time the testing is performed, as well as during the writing the Handback Plan, have third party quality certification, and be financially independent of Developer and not be an Affiliate of Developer.

TxDOT's Approval of the Residual Life Methodology, including the scope and schedule of inspections, shall be required before commencement of Residual Life Inspections.

Developer shall perform all Work necessary to meet or exceed the Residual Life requirements contained in Tables 19-9 and 19-10 by the time of Handback of the Project to TxDOT.

At the end of the O&M Period, Developer shall certify in writing to TxDOT that all physical Elements of the Project meet or exceed their respective Residual Life requirements defined in the Agreement.

19.14.3 Durability Plan

As part of the MMP, Developer shall submit for TxDOT's review a Durability Plan addressing durability for all Maintained Elements with a specified minimum Residual Life of 40 years or greater. The Durability Plan shall be updated and submitted with the applicable Final Design Documents. The Durability Plan shall indicate the durability design basis and the measures in place to ensure the durability requirements are reflected in the Final Design Documents.

Following completion of the Final Design Documents and prior to Substantial Completion, the Durability Plan shall be submitted to TxDOT for review and comment. The Durability Plan shall be updated as necessary based on this review and submitted for TxDOT's final review. Following Substantial Completion and throughout the O&M Period the Durability Plan shall be reviewed annually and updated at least annually to ensure that it is consistent with the MMP and takes account of Good Industry Practice in testing and forecasting Residual Life.
The Durability Plan shall include the maintenance and monitoring strategy, the process for establishing the Residual Life in order to fulfill Section this Section 19.14 of the Technical Provisions for each applicable Element, and shall describe a methodology for the replacement of life expired relevant Residual Elements, including maintenance of traffic considerations that allow the required maintenance of traffic for each direction of travel during replacement.

The Durability Plan shall include the following, at a minimum:

(i) Identification of each applicable Element with the corresponding environmental exposure conditions for each Element (e.g., buried, submerged, exposed to atmosphere, exposed to corrosive chemicals). For Elements exposed to more than one environmental condition (e.g., foundations in water table, foundations in areas with petroleum contamination), include different corrosion considerations for each exposure.

(ii) Identification of relevant degradation and protective mechanisms for each structural Element, quantifying the degradation processes and resistances to these processes with respect to time.

(iii) The time-related changes in performance for each applicable Element at intervals not exceeding 5 years up to the required service life. The design life shall be predicted using deterministic models, published industry guidance and test data, allowing for the environmental conditions, and any proposed protective measures. The models and all assumptions shall be clearly indicated in the Durability Plan.

(iv) Description of measures taken during construction to ensure the assumed quality of construction is achieved (e.g., uniform compaction of embankment, adequate concrete cover, proper curing, etc.).

(v) Summary of the above information, for each Element, in a tabular format and an estimate of life-cycle costs for each structure.

(vi) List of manufacturers of all proposed durability enhancement measures, including coatings, inhibitors, sealers, and membranes.

(vii) Schedule for corrosion inspection of structural Elements indicating the parameters to be measured in order to confirm the underlying performance relative to that predicted in the design, gathered at intervals of not more than 5 years from Substantial Completion.

(viii) Proposed maintenance schedule for items/materials that could be affected by corrosion.

19.14.4 *Residual Life Inspections*

Developer shall perform Residual Life Inspections and testing with appropriate coverage such that the results are representative of the whole Project. TxDOT shall be given the opportunity to witness any of the inspections and/or tests. Developer shall deliver to TxDOT, within ten days after it is created, the output data arising from any testing and any interpretation thereof made by the testers.

Between sixty-three (63) and sixty (60) months prior to the end of the Term, Developer shall perform an initial Residual Life Inspection (the Initial Inspection), including all Elements set forth in the Residual Life Requirements.

Between twenty-one (21) and eighteen (18) months before the end of the Term, Developer shall perform an intermediate Residual Life Inspection (the Intermediate Inspection) including all Elements within the Project, regardless of whether Developer has undertaken Renewal Work for a particular Element in the period since the Initial Inspection.

Between ninety (90) and thirty (30) days before the end of the Term, Developer shall perform a final Residual Life Inspection (the Final Inspection) including all Elements within the Project, regardless of whether Developer has undertaken Renewal Work for a particular Element in the period since the Initial Inspection.

For Specialist Inspections, Developer shall provide, at the submittal of the Handback Plan, all individuals who will be performing the inspections for Handback, and shall demonstrate to TxDOT that these individuals have the skill, experience and certifications to perform the necessary inspections related to Handback.

Developer shall cause all Residual Life Inspections to be undertaken by independent engineers, testing facilities and specialists and shall, where applicable, select independent engineers, testing facilities and specialists from TxDOT's list of Engineering firms qualified for such work. Developer shall cause inspections to follow the latest inspection guidelines (at the time of inspection) issued by TxDOT.

19.14.5 *New Harbor Bridge Structures Residual Life Inspection Requirements*

Developer shall Perform a Hands-on Inspection of all parts of each structure including items such as hidden or limited access components such as cables, bearings and expansion joints.

Developer shall undertake non-destructive testing appropriate to the type of structure and component to include:

(i) measurement of settlement/geometry;
(ii) identification and measurement of de-lamination of concrete;
(iii) measurement of chloride and carbonation profiles from surface to reinforcement and/or stressed tendon level; and
(iv) the in-situ strength testing of concrete elements.

Developer shall include within inspection of steel structures testing necessary to determine the residual life of corrosion protection systems and, where necessary, the depth of corrosion and/or the measurement of remaining structural thickness for hidden and exposed parts. Developer shall test all lengths of welds for cracking at key areas of structural steelwork.

Developer shall remove corrosion protection covers to stay cable anchorages and inspect the anchorages. Developer shall identify for TxDOT Approval the number and location of specific individual stay cable strands to be inspected with further inspections based on the results of these initial inspections. Developer shall reinstate all corrosion protection systems to their original state following inspection.

19.14.6 *New Harbor Bridge Residual Life Methodology Requirements for Structures*

The Residual Life Methodology for structures shall:

(i) draw on historical asset maintenance and repair records, inspection and test histories for each structure;
(ii) take account of the Authority and FHWA records of other structures with similar characteristics;
(iii) include a load rating based on the original structural design calculations, the as-built drawings and the current condition of the structure as a result of specified inspections; and
(iv) take account of any trends in asset deterioration to determine the rate of deterioration and to predict the future condition of individual elements and the entire structure.

19.14.7 *New Harbor Bridge Residual Life Inspection Requirements for Bridge Wearing Surface*

Developer shall cause bridge wearing surface inspections to be undertaken by independent Engineering and Testing Facilities. Developer shall provide a record of Residual Life in each lane and over the full length of the New Harbor Bridge. Inspections shall be repeatable to a level of accuracy defined by the

Residual Life Methodology Report and inspection contracts shall include a proportion of inspections to verify accuracy also defined by the Residual Life Methodology Report.
Bridge wearing surface inspections shall include tests necessary to demonstrate:

(i) integrity and ability to provide protection to the underlying structure;
(ii) ride quality, skid resistance and rutting; and
(iii) any additional testing required to determine Residual Life according to the type of wearing surface used.

19.14.8 *Roadway Section Residual Life Pavement Inspections*

Pavement inspections shall provide a continuous or near-continuous record of Residual Life in each lane. Where the inspection method does not provide a continuous record of Residual Life, the number of valid measurements in each measurement section shall be sufficient to give a statistically valid result. Inspections shall be repeatable to an agreed level of accuracy and inspection contracts shall include an agreed proportion of inspections to verify accuracy. Inspections shall include automated condition distress survey, ride quality, skid resistance, rutting and faulting and measurement of structural capacity of the pavement.

19.14.9 *Roadway Section Residual Life Methodology*

The Residual Life Methodology for road pavement shall take account of the thickness and stiffness of the pavement layers, the pavement loading history in equivalent standard axles as calculated from the traffic volume reports and the forecast traffic volumes, measured in equivalent standard axles, for the 15 years following the end of the O&M Period. At the end of the O&M Period, the structural capacity of each lane of the Mainline roadway shall be such that a rehabilitation design for 10 years of traffic loading starting as of the date of the end of the
O&M Period will require no more than a 2-inch overlay or equivalent treatment for the pavement type. The calculation method may assume that the 2 inch overlay is applied at any time
over the ten years following the end of the O&M Period. The 10 year traffic loading will be determined based on the volume and composition of traffic measured in the year prior to the date upon which the calculation is undertaken. Pavement strength testing and subsequent analysis to determine the structural capacity and the rehabilitation needed to meet the requirement above shall be completed by an independent consultant acceptable to both TxDOT and Developer. Developer shall provide all traffic accommodation to allow pavement strength testing or other testing (either destructive or nondestructive), as required.

19.14.10 *Roadway Section Residual Life Structures Inspections*

Inspections shall follow the latest inspection guidelines (as they apply at the relevant date that the testing is undertaken) recognized by TxDOT. A close examination shall be made of all parts of each structure. Non-destructive tests shall be undertaken appropriate to the type of structure. These shall include the measurement of chloride and carbonation profiles from surface to reinforcement and/or tendon level, half-cell potential and the in-situ strength testing of concrete elements. Testing of steel Structures shall include the depth of corrosion and/or the measurement of remaining structural thickness for hidden and exposed parts. All lengths of weld shall be tested for cracking at key areas of structural steelwork. Bridge deck inspections shall be in accordance with the Durability Plan. Inspections shall include, at a minimum, the identification and measurement of de-lamination in bridge decks by chain dragging or hammer sounding, the measurement of chloride and carbonation profiles from surface to reinforcement and/or tendon level, half-cell potential and the in-situ strength testing of concrete elements.

19.14.11 Roadway Section Residual Life Drainage Inspections

Residual Life inspection of storm sewer systems shall include closed circuit TV inspection of all buried pipe work. Groundwater level monitoring at locations defined in the Residual Life Methodology shall be required to provide assurance of a 10 year Residual Life for groundwater interceptor drains. Inspection of stormwater management systems shall include all components such as ditches, stormwater basins and filters. Inspections of culverts shall include measurement of deformation.

19.14.12 O&M Work Schedule for Handback Requirements

The O&M Work Schedule for five years before Handback shall include, in addition to any other requirements specified in Contract Documents:

- Developer's calculation of Residual Life for each Element calculated in accordance with the Residual Life Methodology and taking into account the results of the inspections set forth above.
- The estimated cost of the Renewal Work for each Element at the end of its Residual Life.

19.14.13 Handback Requirements for Bridge Access Inspection System.

If a maintenance traveler is selected by Developer for the access system to the New Harbor Bridge in accordance with Section 13.2.1.19, the following provisions shall apply. At the end of the Term unless TxDOT instructs otherwise, the maintenance traveler shall remain in place and shall be handed over to TxDOT in safe working order.

At TxDOT's sole discretion, TxDOT may instruct the Developer (providing no less than 365 days notice) that the maintenance traveler shall be decommissioned and removed entirely before the end of the Term. Upon receipt of such instruction, Developer shall submit to TxDOT no later than 270 days before the end of the Term a maintenance traveler removal and replacement plan describing how the maintenance traveler will be safely removed without damage to the New Harbor Bridge. The plan shall demonstrate how TxDOT's future access and inspection requirements may be achieved, either by means of a new traveler to be installed by TxDOT or by another method consistent with Good Industry Practice. Upon TxDOT's approval of the plan, Developer shall decommission and remove from the Site the maintenance traveler components described in the plan no later than 30 days before the end of the Term.

Table 19-10 New Harbor Bridge Residual Life at Handback (Years)

Ref.	Maintained Element	Residual Life at Handback (years)
1	**Structures**	
	All Elements associated with foundations, towers, substructures, superstructure framing system, and deck including: Reinforced concrete Pre-stressed concrete Structural steel External post-tensioning cables	50
	Deck wearing surface	15
	Stay cables and stay cable components	50
	Stay cable dampers	15

Ref.	Maintained Element	Residual Life at Handback (years)
	Sign and lighting structures	50
	Corrosion protection (metalizing) for structural steel	10
	Galvanizing of structural steel	10
	Expansion joints including any replaceable components of such joints	10
	Bearings	25
	Inspection and access equipment	30
	Pedestrian-Only Railings	35
	Railing	35
	Electrical and mechanical parts	10
	Lightning Protection System	10
	Navigational lighting	10
	Other proposed components	As negotiated
2	**Drainage**	
	Bridge deck drainage system including all components, scuppers, fittings, supports and appurtenances	25
	Stormwater drainage system	50
	Inlets	25
3	**Markings and Delineators**	
	Pavement markings	5
	Delineators	5
4	**Guardrails and Barriers**	
	Metal guardrail Concrete traffic barrier	10
5	**Signs**	
	Roadside traffic signs	5

Table 19-11 Roadway Section Residual Life at Handback (Years)

Ref.	Maintained Element	Residual Life at Handback (years)
1	**New Structures**	
	Reinforced concrete Pre-stressed concrete Structural steelwork	50
	Deck wearing surface (structural)	15
	Sign and lighting structures	50
	Corrosion protection for structural steelwork	10
	Expansion joints including any replaceable components of such joints	10
	Bearings	25
	Railing	35
	Retaining Walls	40
	Noise Walls	25
1A	**Existing Structures permitted to remain (Carancahua and Tancahua Street bridges over I-37)**	
	Reinforced concrete Pre-stressed concrete Structural steelwork	25
	Deck wearing surface (structural)	15
	Corrosion protection for structural steelwork	10
	Expansion joints including any replaceable components of such joints	10
	Bearings	25
	Railing	10
2	**Road Pavement**	
	Mainlanes (structural capacity)	10
	Ramps / Direct Connectors (structural capacity)	10
	Frontage Roads (structural capacity)	10
3	**Drainage**	
	Underground storm systems including pipes, manholes, chambers	35
	Culverts / headwalls	35

Ref.	Maintained Element	Residual Life at Handback (years)
	Underdrains, filter drains	15
	End treatments (inlet protections, aprons)	25
4	**Markings and Delineators**	
	Pavement markings	5
	Delineators	5
5	**Guardrails and Barriers**	
	Metal guardrail Concrete traffic barrier Pedestrian /bicycle railing	10
6	**Signs**	
	Roadside traffic signs	5

20 BICYCLE AND PEDESTRIAN FACILITIES

20.1 General Requirements

This Section 20 includes requirements with which Developer shall design and construct all bicycle and pedestrian facilities for the Project. Developer shall ensure that the Work supports TxDOT's commitment to integrate bicycle and pedestrian travel into the Project. All roads to be constructed or reconstructed, on which bicyclists are not prohibited, shall meet bicyclists and pedestrian safety and mobility needs.

Bicycle and pedestrian facilities shall be designed and constructed in conformance with the requirements of the Contract Documents, AASHTO *Guide for the Development of Bicycle Facilities*, AASHTO *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, TMUTCD, ADA, United States Access Board *Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way*, TAS, and TDLR.

20.2 Administrative Requirements

All bicycle and pedestrian facilities shall be maintained and kept operational throughout the Term of the Agreement. Closing bicycle and pedestrian facilities during construction is not allowed.

20.2.1 Meetings

The Developer and TxDOT shall meet at the request of either party, as necessary, to discuss and resolve matters relating to bicycle and pedestrian Work. The requesting entity shall provide the other entity with not less than five Days prior notice of such meetings. Developer shall prepare and distribute a record of meeting minutes within five Days following each meeting.

20.2.2 Coordination with Other Agencies

Developer shall coordinate the Elements of the Project with existing and planned trails and other facilities for pedestrians and cyclists, and with the associated local and county administrations, which include:

- City of Corpus Christi
- County of Nueces
- Corpus Christi Metropolitan Planning Organization

20.3 Design Requirements

Existing bicycle and pedestrian facilities within the Project Limits that are impacted by construction shall be restored to a new condition meeting current standards. The Developer shall incorporate the following Elements relating to shared-use path and bicycle and pedestrian facilities into the Final Design Documents:

a) Alignment, profile, cross-section, and materials;

b) Points of connection to existing and proposed multi-modal facilities;

c) Crosswalk and pedestrian ramp locations and details;

d) Signing, signalization, and pavement markings;

e) Separation between multi-modal facilities and the nearest travel lane;

f) Methods of separation, including barrier and/or fence type and height; and

g) Methods of illumination, where applicable, indicating light fixture locations and types.

20.3.1 Shared Use Path and Bicycle Facilities

Developer shall design and construct a single, continuous shared use path on the northbound side of the New Harbor Bridge as shown on the Schematic Design and Attachment 15-1, Aesthetic Guidelines. The shared use path shall be designed in accordance to Table 20-1. This Work includes all applicable pavement, drainage, curb and gutter, access points, ADA ramps, grading, striping, and signage.

When located on a structure, the shared-use path shall be separated from traffic by a bridge railing.

Table 20-1 Design Parameters for Shared-Use Path Bicycle Facility

Item Description	Schematic Station Limits From	Schematic Station Limits To	Minimum Width Between Railings LF*	Pavement Markings LF*	Minimum Ramps EA**	Drainage***	Pavement Type****
Shared-Use Path	1029+00	1155+00	10	12,600	2	Inlets on bridge, curb and gutter on approach	Match adjacent roadway

* To meet standards as outlined in the AASHTO *Guide for the Development of Bicycle Facilities*

** Ramps shall be ADA accessible and located to meet standards as outlined in TxDOT's *Roadway Design Manual*

*** Drainage to meet criteria outlined in Section 12 (Drainage)

**** Pavement type to meet criteria outlined in Section 8 (Geotechnical) and Section 11 (Roadway)

Developer's facilities shall be consistent with the region's bicycle and pedestrian plans.

20.3.2 Pedestrian Facilities

Developer shall design, construct, and maintain sidewalks along the frontage roads, cross streets, and local streets within the Project Limits and where required by State or federal regulations.

Developer shall design and construct pedestrian facilities, including pedestrian overpasses crossing I.H. 37, as shown on the Schematic Design and according to Section 13.2.1 and Table 11-1 in Section 11.2. The pedestrian overpass width shall be a minimum of 10 feet.

Pedestrian facilities shall be consistent with the City of Corpus Christi's ADA Master Plan for Pedestrian Infrastructure Improvements.

Developer shall install pedestrian signals and curb ramps at all existing and proposed signalized intersections. All pedestrian facilities shall be designed to incorporate ambulatory, visual, and auditory needs of all users.

Developer is responsible for obtaining TDLR reviews and Approvals of pedestrian facility design and construction.