

**STATE OF LOUISIANA**  
**US 90 INTERCHANGE @ LA 85**  
**DESIGN-BUILD PROJECT**

**NEW INTERCHANGE, US 90 @ LA85**  
**ROUTES US 90 & LA 85**  
**IBERIA PARISH**  
**STATE PROJECT NO. 424-04-0032**  
**FEDERAL AID PROJECT NO. ARR-1104(011)**

**CONTRACT DOCUMENTS**

**PART 3 - PERFORMANCE**  
**SPECIFICATIONS**

**APPENDIX A**



**TABLE OF CONTENTS OF PERFORMANCE SPECIFICATIONS**

ROADWAY ..... PS-1

DRAINAGE..... PS-5

GEOTECHNICAL..... PS-8

PAVEMENT STRUCTURE ..... PS-20

STRUCTURES ..... PS-24

TRAFFIC MANAGEMENT PLAN ..... PS-31

PERMANENT SIGNAGE..... PS-34

ENVIRONMENTAL ..... PS-36

UTILITIES..... PS-39

MICROWAVE TOWER RELOCATION ..... PS-43

MAINTENANCE DURING CONSTRUCTION ..... PS-47

## ROADWAY PERFORMANCE SPECIFICATION

### 1.0 INTRODUCTION

The Design-Builder shall design and construct roadways and related work, including main roadways, crossroads, intersections, ramps, travel lanes, shoulders, barriers, transitions and all other roadway-related facilities as required by this specification and by the project scope, required for the safe operation of the new roadways. The design shall provide a workable solution to the project's needs. The roadway and bridge geometry shall meet the Goals established herein, as well as all Standards for Roadway design as outlined within this specification.

The Design-Builder may, however, find ways to improve this geometry. Any innovative alternatives that increase benefits and/or savings to the Department and/or the Design-Builder are encouraged and will be evaluated accordingly.

### 2.0 PERFORMANCE GOALS

The roadway designs required by this section shall be performed and completed such that the roadways and other features are designed and constructed in a manner that is equal to a standard of care which is practiced by engineers performing successful designs for LA DOTD. All roadway geometries shall be designed in accordance with the Standards listed and referenced in this Roadway Performance Specification. The objective of this design work is to result in constructed project facilities within specified criteria while allowing the Design-Builder the flexibility to make changes that produce benefits or savings to the LA DOTD or the Design-Builder without impairing essential functions and characteristics of the Project, including, safety, traffic operations, desired appearance, and maintainability. The primary performance goals for the Project include the following:

- A) Roadway and related features designed & constructed to National Interstate standards;
- B) Design of horizontal alignment that is typical of National Interstate standards and that produces horizontal curves of at least 2,100 feet in length;
- C) Provide a safe facility for the traveling public;
- D) Permanent signage that is clearly visible, provides clear direction and information for users, and complies with all applicable MUTCD requirements;
- E) Permanent pavement markings that give sufficient illumination and reflectorization in daytime and at night and comply with all applicable MUTCD and LADOTD requirements;
- F) Provide driver safety and awareness features (i.e. Rumble strips/stripes);
- G) Smooth horizontal and vertical ride for the traveling public;
- H) Roadway and median barriers that meet NCHRP 350, Test Level requirements and provide a functional and safe environment for the public and maintenance crews, as well as provide adequate glare screening;

- I) Area under guardrails shall be surfaced to prevent growth of vegetation as illustrated in LA DOTD Standard Plans for Highway Guardrails.
- J) Adequate sight distance provided for curves and at intersections; and

### **3.0 STANDARDS AND REFERENCES**

Standards and references specifically cited in the body of this Roadway Performance Specification establish DOTD's Standards and suggested Reference guidelines. Should the requirements in any standard or reference conflict with those in another, the standard or reference highest on the lists presented below shall govern. Listed under References are guidelines that the Contractor may use in addressing the project requirements as he deems appropriate. It is the Contractor's responsibility to obtain clarification of any unresolved ambiguity prior to proceeding with design or construction.

#### **3.1 STANDARDS**

- A) LA DOTD Design Standards for Freeways (F3 Roadway Classification).
- B) Manual of Uniform Traffic Control Devices (MUTCD)
- C) LA DOTD Engineering Directives and Standards Manual (EDSM)
- D) AASHTO Policy on Geometric Design of Highways and Streets (Green Book).
- E) AASHTO Roadside Design Guide
- F) LADOTD Standard Plans
- G) LADOTD Software and Deliverable Standards for Electronic Plans ([http://www.altivasoft.com/ladotd/PDFs/DOTD\\_Software\\_Standards\\_for\\_Electronic\\_Plans.pdf](http://www.altivasoft.com/ladotd/PDFs/DOTD_Software_Standards_for_Electronic_Plans.pdf))

#### **3.2 REFERENCES**

- A) LA DOTD Roadway Design Procedures and Details<sup>1</sup>
- B) A Guide to Constructing Operating and Maintaining Highway Lighting Systems
- C) Highway Capacity Manual, Special Report 209. Third Edition.
- D) FHWA Code of Federal Regulations (CFRs)
- E) Louisiana Standard Specifications for Roads and Bridges, 2006
- F) LA DOTD Highway Specifications Workbook
- G) LA DOTD Special Details
- H) National Cooperative Highway Research Program Report 350.

<sup>1</sup> Section 2.3 EXCEPTIONS TO DESIGN STANDARDS AND POLICIES. Delete the first paragraph in its entirety and replace with the following:

“Every effort shall be made to meet the approved LA DOTD Design Standards for all roadway or bridge projects. Exceptions to design standards shall only be considered when the exception supports an alternative technical concept or value engineering or on a case-by-case basis, at specific locations, where the Design-Builder demonstrates that substantial benefits to the Department and the public would accrue from the Design-Builder’s recommendation. However, no assurance is made that such Design Exceptions will be approved. All Design Exception Requests shall be submitted in accordance with the Louisiana DOTD Design Exception Request Process utilizing the “Design Exception/Design Waiver Form.”

#### **4.0 SCOPE**

The Design-Builder shall design all roadway geometrics including, but not limited to, horizontal alignments, vertical alignments, superelevation, typical sections, median barriers, permanent pavement markings, rumble strips/stripes, and all other required roadway features. The design and construction of this project will be a four-lane divided interstate in accordance with the requirements of the Scope of Services Package. The new 4-lane roadway and interchange ramps will be built completely within the existing state-owned right-of-way.

The Design-Builder shall clearly document any changes to the alignment and stationing of the centerline and maintain a complete record of all such changes for LA DOTD reference.

#### **5.0 REQUIREMENTS**

##### **5.1 Design Criteria**

- A) The roadway design criteria shall be in accordance with Section 3.1 of this Specification.
- B) Ramp modifications and ramp design will be in accordance with LA DOTD Standard plans SC-01 and SC-02.
- C) Highway guardrail design shall be in accordance with LADOTD Standard Plans GR-200, GR-201 and GR-202.

##### **5.2 Permanent Pavement Markings**

- A) 1½ inch black contrast backing will be required for white centerline pavement striping used on concrete pavements.
- B) All other requirements for pavement markings shall be in accordance with Manual of Uniform Traffic Control Devices (MUTCD) and LADOTD Standard Plan PM-01.

##### **5.3 Rumble Strips**

- A) Rumble strips are required at the edges of the innermost and outermost travel lanes and according to LA DOTD special details.

- B) Rumble strips are not allowed more than 2” beyond the inside edge of final striping.
- C) Rumble Strip application will be as follows:

<b>Type of Surfacing</b>	<b>Inside Shoulder</b>	<b>Outside Shoulder</b>
Asphaltic Concrete Pavement	Raised Pavement Markings	Existing Rumble Strip to Remain
PCC Pavement	Raised Pavement Markings	Existing Rumble Strip to Remain

**5.4 Median Barriers**

- A) Median Barriers are required if the final median width (travel lane to travel lane) is less than 60 feet.
- B) Required median barriers will be concrete and constructed at a location beyond the 12-foot width of the inside shoulder section and on an independent reinforced concrete footing.
- C) Median Barriers shall meet NCHRP 350 Test Level 5 requirements.
- D) Median Barriers shall not be less than 54” in height.
- E) Cable barriers will not be allowed.
- F) Incidental concrete paving shall be provided within the median if median width between the barrier rails is equal to or less than 20 feet.

**DRAINAGE  
PERFORMANCE SPECIFICATION**

**1.0 INTRODUCTION**

The Design-Builder shall provide drainage facilities designed to safely and efficiently handle stormwater runoff, and to satisfy environmental commitments. The Design-Builder shall abide by the standards in this Performance Specification and elsewhere in the Design-Build Contract as they pertain to drainage facilities, including NPDES and other permit requirements. The Design-Builder shall obtain clarification of any unresolved ambiguity prior to proceeding with design and/or construction.

**2.0 PERFORMANCE GOALS**

The Design-Builder shall meet the following performance goals, (in the sole determination of the LA DOTD):

- A) Cross drain pipes must be sized to accommodate 50-year design peak discharge using SCS Method and, selected material must have 70-year service life.
- B) Side drain pipes must be sized to accommodate 5-year design peak discharge. If the channel is providing an outfall or the major approach channel for a cross drain, side drain pipes must be sized to accommodate 50-year design peak discharge and, selected material must have 30-year service life.
- C) Hydraulic design that does not create design exception requirements.
- D) Hydraulic design that does not increase the magnitude of existing deficiencies.
- E) Effective drainage throughout the project limits.
- F) Drainage structures extended beyond clear zone.

**3.0 STANDARD PERFORMANCES**

The Design-Builder shall plan, design, construct, and implement drainage in accordance with this Drainage Performance Specification and the requirements of the following standards. Standards and references specifically cited in the body of this Performance Specification establish requirements that have precedence over all others. In this Drainage Performance Specification, if the requirements in any standard conflicts with those in another, the standard highest on the list will govern. Listed under references are guidelines that the Design-Builder may use in addressing the requirements as the Design-Builder sees fit. It is the Design-Builder's responsibilities to obtain clarification of any ambiguity within this Performance Specification prior to proceeding with design and/or construction.

**3.1 STANDARDS**

The standards for this Drainage Performance Specification are contained in the Engineering Directives and Standard Manual (EDSM), Louisiana Department of Transportation and Development <http://webmail.dotd.louisiana.gov.ppmemos.nsf>. Standards are listed in descending order of precedence. In case of conflict between or among standards, the order of precedence established by the LA DOTD

## Louisiana Department of Transportation and Development

---

will govern. See the table below for applicable EDSMs.

<b>EDSM Reference</b>	<b>Title</b>	<b>Comment</b>
II-2.1.1	Design Policy for Cross Drains, Side Drains, Underdrains, Storm Drains	The (3-20-07) "Revised Pipe Policy" will have precedence over any conflicting requirements
II-2.1.6	Procedures for Determining Coating And Thickness Requirements for Metal Pipe	
II-2.1.8	Shoulder Drainage Systems	
II-2.1.12	Pavement Structure Design	
II-2.1.13	Procedure for determining Type of Plastic Pipes, Permissible Usage, Quality Control and Installation Requirement.	
III-1.1.4	Form No. 4206 Right of Entry	
III-1.1.13	Encroachments	
III-1.1.23	Development of a Traffic Control Plan	
III-2.5.1	Construction Joints Bridges and Structures	
III-2.6.3	Conduit Backfill Requirements	
IV-2.6.3	Communication Cable Installation on Highway Structures	
IV-2.1.9	Pipeline Crossings and the Use of Thermoplastic Pipe	
V-1.1.1	Policy for Using Embankment Materials with swell potential	

### 3.2 REFERENCES

The version of the following references in effect on the Proposal due date may apply:

- A) The Louisiana Department of Transportation and Development's Roadway Design Procedures and Details.
- B) The Louisiana Department of Transportation and Development's Hydraulics Manual.
- C) The Louisiana department of Transportation and Development's User's Manual for Hydraulics Programs.
- D) The FHWA HEC-18 and HEC-20 For Scour Analysis

### 4.0 SCOPE

The design and construction of all drainage and other culvert facilities must adequately address runoff control, safety, functionality, erosion mitigation, durability, ease of maintenance, maintenance access, and



current uses. All ditches, outfalls, and pipe crossings must be designed to address all performance goals as well as functionality, headwater, discharge, design storm, minimum cover, and pipe/RCB size.

**5.0 PERFORMANCE MEASURES**

LA DOTD shall be satisfied that the drainage design and materials will meet the performance goals and that the design and system will provide effective drainage throughout the project limits.

**6.0 REQUIREMENTS**

- A) Plastic pipe will not be allowed except in the application as described in the referenced Revised Pipe Policy (EDSM II-2.1.1).
- B) Metal culverts are not allowed.

**GEOTECHNICAL  
PERFORMANCE SPECIFICATION**

**1.0 INTRODUCTION**

The Design-Builder shall conduct geotechnical investigations, analyses, design, and construction in accordance with all applicable criteria and standards cited herein and in accordance with this Geotechnical Performance Specification.

**2.0 APPLICABLE STANDARDS AND REFERENCES**

The geotechnical investigation and design shall be in accordance with this Geotechnical Performance Specification and the relevant requirements of the following standards unless otherwise stated in this Performance Specification. Standards and references specifically cited in the body of this Geotechnical Performance Specification establish requirements that shall have precedence over all others. Should the requirements in any standard conflict with those in another, the standard highest on the list presented below shall govern. The Design-Builder may use References as guidelines in addressing the requirements. It is the Design-Builder's responsibility to obtain clarification of any unresolved ambiguity prior to proceeding with design or construction. Items listed as standards or references in this Geotechnical Performance Specification shall be the most recent version available at the time of issuance of the Scope of Services Package.

**2.1 STANDARDS**

- A) AASHTO LRFD Bridge Design Specifications, 4th Edition, 2007 with 2008 and 2009 Interim Revisions;
- B) AASHTO LRFD Bridge Construction Specifications, 2nd Edition with applicable Interim Revisions;
- C) Louisiana Standard Specifications for Roads and Bridges, 2006 Edition except Section 804; and
- D) Revised Section 804 of the Louisiana Standard Specifications for Roads and Bridges (Revised for LRFD).

**2.2 REFERENCES**

- A) Subsurface Investigations, FHWA-HI-97-021, 1997;
- B) Drilled Shafts: Construction Procedures and Design Methods Manual, FHWA IF-99-025, 1999;
- C) Design and Construction of Driven Pile Foundations, Volumes 1 and 2, FHWA HI-95-038, 1998;
- D) Soils and Foundation Workshop Manual, FHWA;
- E) Earth Retaining Structures, FHWA-NHI-99-025, 1999;

- F) Prefabricated Vertical Drains, Vol. No. 1, FHWA- RD-86-168, 1986;
- G) XSTABL, Version 5, Interactive Software Designs, Inc. 1994 or PCSTABL4;
- H) LA DOTD MSEW Design Guide, Pavement and Geotechnical Services Section;
- I) Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines, FHWA NHI-00-0043, 2001;
- J) Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, FHWA Demonstration Project 82 Ground Improvement, FHWA NHI-00-044, 2000;
- K) Geosynthetic Design and Construction guidelines, FHWA HI-95-038, current edition;
- L) Geotechnical Instrumentation Manual, FHWA HI-98-034, 1998;
- M) Advanced Technology for Soil Slope Stability, Volume 1: Slope Stability Manual FHWA-SA-94-005, 1994;
- N) LA DOTD Bridge Design Manual, including memorandums and any revisions issued by the State Bridge Engineer prior to date of the Final Scope of Services Package;
- O) LA DOTD Special Provisions and Supplemental Specifications;
- P) LA DOTD Standard Drawings; and
- Q) Soil Borings.

### **3.0 REQUIREMENTS**

#### **3.1 GEOTECHNICAL PLANNING REPORT**

The Design-Builder shall prepare a Geotechnical Planning Report for the Project and submit the Geotechnical Planning Report within 60 days from Notice to Proceed for review and written comment. The Geotechnical Planning Report shall include a detailed method statement describing the general philosophy and methods of design and construction and the rationale for selection of the proposed construction methods for all geotechnical and foundation aspects of the Project. The method statement shall indicate how material and design details are chosen to match selected construction methods, construction details, and the soil and groundwater environment for the site.

The Design-Builder shall provide details of equipment and methods proposed for foundation and earthwork construction and demonstrate how they are consistent with the design approach and assumptions. The details presented shall demonstrate compliance with the Geotechnical Performance Specification requirements and shall demonstrate an understanding of the ground conditions and Project constraints as defined within this Contract.

The Design-Builder shall submit the following technical information with the Geotechnical Planning Report:

## Louisiana Department of Transportation and Development

---

- A) Description of geology and various ground types to be encountered along the alignment;
- B) A description of the geotechnical information that was collected and analyzed in developing the interpretation used to develop the Design-Builder's Proposal and pricing for the Project;
- C) Assessment of the engineering properties of all soil types, including the expected average and range of soil strengths and deformation properties;
- D) Recommended design parameters (preliminary) for all soil types;
- E) Anticipated ground behavior and categorization of ground during excavation, filling, and foundation and retaining structure construction;
- F) Support of excavation and groundwater control considerations;
- G) A narrative describing how any interpretation was derived from the geotechnical data;
- H) Consideration for, discussion of, and rationale for protection of existing structures, bodies of water, and environmentally or historically sensitive areas; and
- I) Any pertinent geotechnical data used as a basis for selection, design, and installation of the proposed foundation elements.

The Geotechnical Planning Report shall define the engineering and design approach that will be followed in order to develop technically and environmentally acceptable and durable foundations, cut and fill slopes, retaining structures, and geotechnical designs for the Project. The Geotechnical Planning Report shall discuss all aspects of the required geotechnical effort and design and analysis, including the following:

- 1) Additional Subsurface investigations;
- 2) Determination of geotechnical and foundation design parameters;
- 3) Erosion control measures and design and analysis;
- 4) Embankment and fill settlement and slope stability analysis;
- 5) Retaining wall design and analysis;
- 6) Planned field testing programs, including pile and drilled shaft integrity and load testing and ground improvement testing;
- 7) Ground improvement or treatment of in-situ soils;
- 8) Selection, design, and analysis of foundation systems;
- 9) Lateral and vertical earth pressures;
- 10) Instrumentation and monitoring programs; and

11) Expected serviceability and durability of proposed solutions.

The Geotechnical Report shall be prepared and signed and sealed by a Licensed Professional Engineer registered in the State of Louisiana meeting the qualification requirements in Appendix 108C – Key Personnel Qualifications and Requirements.

### **3.2 SUBSURFACE INVESTIGATION AND DATA ANALYSIS**

#### **3.2.1 General**

A systematic subsurface investigation of the Project site has been performed by the LA DOTD. Information generated from the completed investigations conducted by the LA DOTD has been provided to the Design-Builder for evaluation of the subsurface conditions along the alignment and for concept level design of the various structures. The Design-Builder shall conduct additional investigations in accordance with the scope specified herein and any additional investigations the Design-Builder deems necessary to establish the geotechnical conditions and to perform all geotechnical and foundation design and analyses.

These additional investigations and testing shall be conducted in accordance with the reference items identified in Section 2.2.

The Design-Builder shall form its own interpretation of the existing geotechnical data and satisfy itself as to the nature of the ground and sub-soil, the form and nature of the site, and nature of the Work that may affect its detailed design, construction method, and tools. LA DOTD neither assumes nor implies any other warranty regarding the data provided, other than that the information was obtained at locations and depths indicated and to the accuracy of the data at the time of testing.

The additional investigations to be performed by the Design-Builder shall supplement the data provided by the LA DOTD. The Design-Builder shall determine the number and location of additional investigations in accordance with the requirements presented in Table 10.4.2-1 of the AASHTO LRFD Bridge Design Specifications (herein after AASHTO Specifications). Subsurface investigation requirements not covered in the AASHTO Specifications are presented in Table 3.2.1. Existing investigation borings may be combined with the additional investigations to comply with the requirements presented in Table 3.2.1. Cone Penetration Test soundings may be considered as an alternative to all borings where the Design-Builder considers it appropriate provided that a sufficient number of borings are performed at Cone Penetration Test sounding location to develop reliable correlation between the boring and Cone Penetration Test results. The Design-Builder shall provide the results of investigations to the LA DOTD in a memo as follows:

- A) The logs of borings,
- B) Cone Penetration Test soundings,
- C) the field records of any field investigations; and
- D) Laboratory test results.

**Table 3.2.1 Minimum Requirements for Additional Investigations**

Geotechnical Feature	Minimum Investigation Locations
Roadways	The spacing of borings or Cone Penetration Tests along the roadway alignment shall not exceed 200 feet. The spacing and location of the borings shall be selected considering the geologic complexity and soil/rock strata continuity within the Project area with the objective of defining the vertical and horizontal boundaries of distinct soil units within the Project limits.
Embankments and Cuts	The spacing between borings shall be no greater than 200 feet. At critical locations, provide a minimum of three borings in the transverse direction to define the existing geological conditions for stability analysis.
Culverts	A minimum of one boring at each culvert with embankment height greater than five feet. Additional borings shall be provided for long culverts or in areas of erratic subsurface conditions.

Note: Except as specified herein, LA DOTD and AASHTO standards shall be followed with respect to planning and performing subsurface exploration programs.

### **3.3 FOUNDATION DESIGN**

Maximum pile loads, foundation embedment and geotechnical design for Project structures shall conform to AASHTO Specifications, 4th Edition. The Design-Builder shall not use screw piles or existing foundations. Timber piles and spread footing foundations shall not be used for bridge foundations, but may be considered for support of retaining walls in accordance with Section 3.4 of the Geotechnical Performance Specification.

The LRFD method shall be used to design the foundations. Foundation types that are not included in the AASHTO Specifications shall be allowed, if the Design-Build provides the properly calibrated resistance factors for Louisiana soils based on the calibration methods presented in NCHRP 507. All backup of the calibration shall be submitted for review and approval. LA DOTD may reject the resistance factors at its discretion.

#### **3.3.1 Deep Foundations**

Allowable pile loads for piles fully laterally supported shall not exceed the values Listed in the LADOTD Bridge Design Manual (herein after Bridge Design Manual).

Pile bent structures shall meet buckling requirements as per the Bridge Design Manual. The Design-Builder shall consider non-axial pile loads and shall analyze pile bent structures considering slenderness limitations to determine if they are acceptable.

For shaft penetration considerations, the geotechnical support capacity of the drilled shafts shall be determined and shall be verified by appropriate number of field load testing acceptable to LADOTD.

Concrete for drilled shafts shall be in accordance with Class S Concrete as specified in the LA DOTD Standard Specifications for Roadways and Bridges (herein after Standard Specifications), except that, a) the minimum concrete strength shall be 3,800 psi, b) the coarse aggregate shall be Grade P, but with a maximum size of  $\frac{3}{4}$  inch, and c) the slump shall be between 7 and 9 inches.

The center to center spacing of drilled shafts and piles shall be at least three times the larger diameter (drilled shaft or pile) of the adjacent foundation elements.

### **3.3.2 Vertical Capacity**

Deep foundations shall be analyzed for axial compression and uplift resistance, using static analysis methods in accordance with AASHTO Specifications. A resistance factor consistent with the level of construction control (i.e., test piles, wave equation, and dynamic monitoring) and site variability shall be applied to the ultimate capacity in accordance with AASHTO Specifications. The capacity shall be verified by appropriate number of field tests as specified in the AASHTO Specifications. The effectiveness of base preloading, if used for drilled shafts, shall be demonstrated by Osterberg load tests conducted both prior to and following preloading operations, with the number of Osterberg load tests determined in accordance with Article 3.3.7 of this Geotechnical Performance Specification.

### **3.3.3 Settlement**

The design of deep foundations shall consider the total and differential settlement tolerances of the proposed structures. Settlement and differential settlement shall not exceed the design tolerances, or the tolerances specified in the Bridge Design Manual, whichever is less. Settlement induced by the deep foundation group in the subsoil shall be evaluated. In addition, settlement of the individual deep foundation elements shall also be evaluated.

### **3.3.4 Downdrag (Negative Skin Friction)**

The design of deep foundations shall consider the effect of downdrag (negative skin friction) from ongoing ground settlement, construction dewatering, variable groundwater conditions, placement of fill or embankments, and/or pile installation. Downdrag loads shall be determined by considering the load transfer distribution along the deep foundation element as well as the group layout. Appropriate load factors in accordance to the AASHTO Specifications shall be applied to evaluate the foundation behavior.

### **3.3.5 Lateral Load Capacity**

Deep foundations shall be designed to adequately resist the lateral loads transferred to them from the structure without exceeding the allowable deformation of the structure or overstressing the structure or foundation elements.

Where the lateral resistance of the soil surrounding the piles is inadequate to resist the applied loads, the use of batter piles may be considered. Where battered piles are proposed, the battered piles shall not encroach on property outside the Right-of-Way (ROW). Battered drilled shafts shall not be used.

### **3.3.6 Wave Equation Analyses**

The constructibility of a pile design and the development of pile driving criteria shall be performed using a wave equation computer program. The use of dynamic pile driving formulas will not be an acceptable

method for developing driving criteria or performing drivability studies to determine hammer energy requirements.

### **3.3.7 Deep Foundation Testing and Monitoring**

Field testing shall be performed for deep foundations to evaluate foundation capacity and integrity, to verify design assumptions, to determine foundation installation characteristics, to evaluate the pile driving system performance, and to establish foundation depths. The foundation testing and monitoring shall include indicator, monitor, and test piles or drilled shafts; dynamic testing; static load testing; non-destructive integrity testing; and Quality Control (QC) testing. All foundation testing shall be performed by the Design-Builder, using testing personnel or Subconsultants, qualified and experienced in performing and interpreting the required foundation testing.

A pile driving analyzer shall be used to determine if each hammer is delivering the energy required by the design. Dynamic pile testing and static load testing shall be performed in accordance with the Bridge Design Manual and the Standard Specifications, except as specified herein. Dynamic testing shall be performed on all test piles, indicator piles and monitoring piles. Not less than five percent of the production piles shall be used as monitoring piles.

Static load tests shall be performed on piles in accordance with the Bridge Design Manual and the revised Section 804.11 of the Standard Specification (revised for LRFD), except as specified herein. Static load tests shall be performed at each of the locations representative of the different subsurface conditions, pile types, pile capacities, and pile depths. The number and locations of these other load test piles shall be determined by the Design-Builder and included in their cost estimate and planning report.

Osterberg Load Cell tests shall be performed on drilled shafts at each of the locations representative of different subsurface conditions, drilled shaft capacities, and drilled shaft diameter and depths in accordance with LA DOTD EM804. The number and locations of these other load test shafts shall be determined by the Design-Builder.

Integrity testing consisting of Crosshole Sonic Logging shall be performed on all drilled shafts. The testing shall be performed in accordance with Section 814.19 of the Standard Specifications.

Prior to the start of construction activities, the Design-Builder shall prepare and submit a detailed description of the proposed foundation testing and monitoring programs to the LA DOTD for their review and comment. The description shall include specifications and plans presenting the type, purpose, number, location, and procedures for each test and the recording and reporting procedures. Testing and monitoring of deep foundations shall be in accordance with the applicable LA DOTD, ASTM, and AASHTO specifications.

### **3.3.8 Drilled Shaft Foundations**

Drilled shaft foundations may be considered.

## **3.4 RETAINING WALL DESIGN**

Retaining walls may consist of mechanically stabilized earth (MSE) walls, cast-in-place concrete cantilever walls, or other types of walls suitable to the required application and all performance requirements. Wall types that shall not be used for permanent applications are identified in the Structures



performance Specifications. All walls shall be designed for a minimum service life of 75 years for general case and for a minimum service life of 100 years when the walls support structure loads.

MSE walls used for the Project shall include only those wall systems included on the LA DOTD's list of qualified wall systems. The Design-Builder may propose a MSE wall system that is not currently included on the LA DOTD list of qualified wall systems, but it will be necessary to submit all information required by LA DOTD regarding the proposed wall system and for LA DOTD to add the proposed wall system to the LA DOTD list of approved wall systems before the proposed wall system can be used for the Project.

Design of MSE walls shall be in accordance with procedures presented in the FHWA's "Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines" (referenced in Section 2.2). Design of other types of retaining walls shall conform to current engineering practice as defined in the AASHTO Standard Specifications for highway Bridges indicated in Section 2.1 as applicable to the specific type of wall used.

### **3.4.1 Design Loads**

### **3.4.2 Vertical Loads**

The loads used in the design of permanent Work shall be in accordance with the requirements of the relevant design codes and Standards, except where herein modified or augmented.

Estimation of live loads due to pedestrian, or highway traffic shall be in accordance with the requirements of AASHTO LRFD Specifications.

Loads due to soils or backfill shall be derived using the maximum values of the saturated densities. Only where it can be clearly demonstrated that the fill is well drained, and will remain well drained in the future, shall any reduction in the degree of saturation be allowed. The submerged densities shall be used for soil unless the location is above the standing water table.

### **3.4.3 Lateral Pressure**

Lateral earth pressures shall be estimated on the basis of the anticipated movement of the structure. For yielding retaining structures, Rankine's active pressure theory shall be used. However, for unyielding structures, where the movement of the structures is not sufficient to mobilize active pressures, and/or where compacted backfill is placed behind the structure, the lateral pressure on the structures shall be evaluated on the basis of anticipated movements, site-specific subsurface conditions and construction methods. The pressure on unyielding structures shall not be less than at-rest pressure. The design of the retaining structures shall be based on the maximum lateral pressures that will develop behind the structures.

Hydrostatic pressure induced by the groundwater table, when present, shall be included in the lateral pressures. Additional hydrostatic pressures and variations in groundwater conditions due to flooding and rapid drawdown conditions shall be considered in the design of the retaining structures.

### **3.4.4 Deep Foundations**

Deep foundations for retaining walls shall be designed in accordance with Subsection 3.3.

### **3.4.5 Shallow Foundations**

Shallow foundations for retaining walls are permitted where there is a suitable bearing stratum near the surface. But shallow foundations shall not be used where scour or erosion could undermine or adversely impact the performance of the foundation.

Shallow foundations shall be analyzed for bearing capacity in accordance with AASHTO Specifications. Punching and local failure of the footing shall also be evaluated. Walls shall be proportioned so that the resultant of all forces acting falls within the middle third of the footing base.

Analyses shall be conducted to estimate the total and differential soil settlement, induced by the foundation loads. The analyses shall consider immediate settlement for granular soils and immediate settlement, primary consolidation and secondary compression for cohesive soils. Shallow foundations shall be designed to maintain wall settlements (total and differential) within the applicable tolerances specified in the FHWA Manual on Earth Retaining Structures (Reference E in Section 2.2.).

### **3.4.6 External and Internal Stability**

Both external and internal stability analyses shall be conducted in accordance with the AASHTO Specifications.

## **3.5 FILL/EMBANKMENT DESIGN**

### **3.5.1 Excavation and Embankment**

Excavations and embankment construction shall be in accordance with the requirements of Section 203 of the Standard Specifications for Roads and Bridges. Embankment cross sections shall be in accordance with the requirements of the Roadway Performance Specification.

### **3.5.2 Slope Stability**

Particular attention shall be given to the design of all soil and rock embankment side slopes, whether temporary or permanent. The analyses shall consider the effects of deterioration and loss of soil resistance due to local climatic and construction conditions. All slopes shall be designed to minimize erosion by rainfall and runoff. Adequate drainage and erosion control provisions should be incorporated in the design and construction of the embankments in accordance with Subsection 3.9.

Slope stability analyses shall be conducted using a suitable computer program acceptable to LA DOTD. Circular and wedge type failures shall be analyzed for potential occurrence for each embankment configuration and slope. The evaluation of global slope stability shall consider potential seepage forces and any weak deposits and seams that are adversely impacted by water flow. The minimum factors of safety for static load conditions shall be 1.3 for non-critical slopes and 1.5 for critical slopes (at bridge abutments, wingwalls and existing structures) for permanent embankment slopes. The minimum factor of safety for a rapid drawdown condition shall be 1.1. For non-permanent embankment and earthwork slopes, the minimum safety factor shall be 1.3 under static load conditions.

### **3.5.3 Settlement**

Analyses shall be conducted to estimate the soil settlement induced by the embankment loads. Immediate

settlement in granular soils and both immediate and consolidation settlements in cohesive soils shall be considered. Embankments shall be designed to keep estimated total long term settlements limited to one inch during a period of 75 years after completion of the pavement construction. Differential settlement both within fill sections and across fill/structure interfaces shall be limited to 1/300. Embankment settlement shall be monitored and assessed during the duration of the Contract to verify that the specified settlement criteria will be achieved.

**3.6 REINFORCED SOIL SLOPE (RSS) DESIGN**

The design procedures and considerations for reinforced soil slopes shall conform to the requirements of the FHWA Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines, [see Section 2.2(I)]. Performance requirements are presented in Table 3.6 as follows:

**Table 3.6 Minimum Factors of Safety for Design of RSS**

Failure Mode	Minimum Safety Factor
<b>External Stability:</b>	
Sliding	1.5
Local Bearing Capacity	1.5
Global Slope Stability	1.5
General Bearing Capacity	3.0
Settlement	See Subsection 3.5.3
<b>Internal Stability:</b>	
Compound Failure	1.5
Slope Stability	1.5
Rupture Strength	> Allowable Reinforcement Tension
Pull-out Resistance	1.5 (granular soils)
Pull-out Resistance	2.0 (cohesive soils)

Adequate drainage provisions, slope protection and erosion control provisions shall be incorporated into the RSS designs in accordance with requirements of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines and as required in Subsection 3.9.

**3.7 SOIL IMPROVEMENT**

The use of soil improvement to increase soil strength and reduce compressibility in order to increase the safety factors for external and internal stability and reduce settlements to the allowable range specified herein will be allowed in the design. It shall be necessary to demonstrate their suitability for local conditions and installation methods. Techniques such as vertical drains, surcharge, stone columns, vibrocompaction, lime columns, cement columns, deep soil mixing, rammed aggregate pier, and grouting may be included in the design in order to expedite consolidation of the subsoils, where it is required to increase bearing capacity or reduce post-construction settlements.

All soil improvement systems shall be designed using current practice and procedures. The performance of all ground improvement techniques shall be verified with a pre-production field testing program developed to demonstrate that the proposed methods and design will provide the ground improvement level required to satisfy the performance requirements specified herein.

### **3.8 SOIL CUT SLOPES**

Geotechnical analyses of soil cut slopes shall be performed to assess soil slope stability along new and existing soil cuts.

Potential circular and wedge type failure modes shall be analyzed for each soil cut and each slope and orientation. Geotechnical analysis of soil cut slopes shall be performed using suitable computer programs approved by LA DOTD (see Section 2.2, Reference G). A minimum factor of safety of 1.5 or greater shall be assured.

### **3.9 EROSION CONTROL AND DRAINAGE**

Slopes in both cut and fill areas are subject to erosion and deterioration through the action of water, wind and freeze/thaw cycles. Erosion control and drainage measures shall be evaluated, considered and designed for all new and existing slopes. Erosion of slopes presents a significant maintenance issue and stability problem on slopes. Soil strata that are susceptible to erosion shall be mapped and delineated for all existing and new fills and cuts. Slope protection measures shall be evaluated on site-specific conditions, such as surface and subsurface conditions, cut geometry, and susceptibility of erosion or deterioration. Each cut and fill slope that requires erosion control and drainage measures shall be evaluated for the following:

- A) Reduction of Water Flow across Slope;
- B) Slope Revegetation;
- C) Slope Armor;
- D) Subsurface Water Control.

### **3.10 CONSTRUCTION INSTRUMENTATION MONITORING PROGRAM**

The Design Builder shall prepare a geotechnical instrumentation program to monitor settlement, lateral movement of temporary and permanent embankments, cuts and structures during construction. Consideration shall be given to extending instrumentation monitoring for a period after completion of construction when long-term performance issues are a concern. For foundations placed within 3 diameters (the larger of the adjacent pile, pile group, or drilled shaft) of the foundation element, the Design-Builder shall provide settlement monitoring for the new and the existing foundations during construction and one year post construction to verify the design objectives are met. The Design-Builder shall prepare a report detailing the proposed program of instrumentation and monitoring, establishing threshold values of monitored parameters, and describing the response plans that will be implemented when threshold parameters are exceeded. Upon acceptance of the instrumentation plan, threshold values and response plan, the Contractor shall provide, install and monitor the instrumentation during and after construction and interpret the data. Construction instrumentation monitoring reports shall be submitted to the LA DOTD not less than every two weeks. Corrective actions shall be taken where the instrumentation data so

warrant.

The design shall protect adjacent structures and utilities against damage due to the construction of the permanent Work. Limiting values of movement (horizontal and vertical) and distortion on each structure and utility within the zone of influence of the Work shall be established and submitted to LA DOTD for review. Instrumentation shall be used to monitor all preload embankments to verify the effectiveness and duration of the surcharge loading. Vibration monitoring shall be performed in accordance with the requirements in the Environmental Mitigation and Compliance Performance Specification. The extent of the monitoring program will depend on the size and type of the facilities.

A detailed monitoring program shall be prepared for each structure, utility and embankment affected by the Work, subject to review by LA DOTD. The instrumentation and monitoring program shall include appropriate types and quantities of monitoring instruments capable of measuring horizontal and vertical movements, soil pore water pressures, vibrations, and noise, as applicable.

The design and distribution of instrumentation shall demonstrate an understanding of the need, purpose and application of each proposed type.

### **3.11 AS-BUILT PLANS**

As-Built Plans shall include foundation detail sheets signed and sealed by the Geotechnical Engineer; a Licensed Professional Engineer registered in the State of Louisiana. These sheets shall include appropriate information necessary to detail the design and construction of foundations. Examples of such information to be provided include the following:

- A) Pile data tables;
- B) Pile lengths;
- C) Pile tip elevations; and
- D) Pile cutoff elevations.

**PAVEMENT STRUCTURE  
PERFORMANCE SPECIFICATION**

**1.0 INTRODUCTION**

This Pavement Structure Performance Specification (PSPS) outlines performance goals and measures that the Design-Builder shall utilize in designing and constructing pavement sections such that the pavement will perform under the conditions (climate and loading) for the specified periods. These criteria apply to all pavements to be constructed as a part of the Project, and must result in the construction of a pavement structure that will be acceptable to the Federal Highway Administration (FHWA) for an Interstate system.

**2.0 PERFORMANCE GOALS**

Pavement sections must be designed and constructed to accommodate 20 years of projected traffic from the date of Final Acceptance for either Portland Cement Concrete Pavements (PCCP), Stone Matrix Asphalt (SMA), or Superpave Hot Mix Asphalt Concrete Pavements. Shoulders should be designed appropriately for any anticipated temporary or permanent traffic loadings. Additionally, the Design-Builder shall meet the following performance goals, in the sole discretion of the LA DOTD:

- A) Performance of a Life Cycle Cost Analysis;
- B) A typical pavement section that is carried through the travel lanes where any new pavement is placed, base courses of the travel lanes will be carried through the shoulders;
- C) Pavement sections that are designed for projected ESAL loadings plus any percentage increases;
- D) Pavement that provides necessary load transfer (where applicable);
- E) Pavement that is designed to meet in-situ soil properties;
- F) Performance of adequate dust abatement during construction;
- G) The same surface type material on all travel lanes; and
- H) Area under guardrails shall be surfaced to prevent growth of vegetation as illustrated in LA DOTD Standard Plans for Highway Guardrails.

**3.0 STANDARDS AND REFERENCES**

The Design-Builder shall plan, design, and construct pavement structures in accordance with this PSPS and the requirements of the following standards. Standards and references specifically cited in the body of this PSPS establish requirements that have precedence over all others. In this PSPS, if the requirements in any standard conflict with those in another, the standard highest on the list will govern. The Design-Builder may use References as guidelines in addressing the requirements. It is the Design Builder's responsibility to obtain clarification of any ambiguity within this PSPS prior to proceeding with design or construction.

**3.1 STANDARDS**

The standards for this PSPS are listed in descending order of precedence. In case of conflict between or among standards, the order of precedence established by the LA DOTD will govern.

- A) AASHTO Guide for Design of Pavement Structures (1993); and
- B) The Louisiana Department of Transportation and Development's Special Provisions;
- C) The Louisiana Department of Transportation and Development's Supplemental Specifications;
- D) The Louisiana Department of Transportation and Development's Standard Plans;
- E) Louisiana Department of Transportation and Development's Standard Specifications for Roads and Bridges 2006 Edition;
- F) The Louisiana Department of Transportation and Development's Testing Procedures Manual; and
- G) The Louisiana Department of Transportation and Development's Qualified Products List (QPL);
- H) ASTM E274, Standard Test Method for Skid Resistance of Paved Surfaces Using a Full-Scale Tire

### **3.2 REFERENCES**

The version of the following references in effect on the Proposal due date may apply:

- A) DARWin Pavement Design Software.

### **4.0 SCOPE**

The Design-Builder shall design and construct pavement to accommodate 20 years of projected traffic. The Design-Builder shall provide either a rigid, flexible, or composite pavement structure according to the criteria set forth in this PSPS that gives due consideration to surface and subsurface drainage as well as the elimination of trapped water.

### **5.0 PERFORMANCE MEASURES**

The parameters that will be used by the LA DOTD to evaluate performance of all newly constructed and rehabilitated pavements at Final Acceptance for this Project are identified in Sections 5.1 through 5.4.

These parameters will be evaluated by the Design-Builder in coordination with the LA DOTD, both during construction and at Final Acceptance.

#### **5.1 RIDE QUALITY**

Ride quality will be evaluated in newly constructed full depth travel lanes using an inertial profiler (or equivalent substitute device as outlined in LA DOTD's Standard Specifications for Roads and Bridges 2006 Edition Sections 502 and DOTD-TR 644-06).

For new PCCP, the IRI must be 75 or less with no individual 0.05 mile segment having greater than an average of 95 in/mile IRI using the testing procedure described in LA DOTD's DOTD-TR 644-06. The IRI for new structural hot mix asphalt must be 65 or less using the testing procedure described in LA DOTD's Standard Specifications for Roads and Bridges 2006 Edition Section 502 and DOTD-TR 644-06.

#### **5.2 SKID RESISTANCE**

Final Acceptance will require a value of skid resistance greater than 36 for new or existing pavement. Test method will be ASTM E274, "Standard Test Method for Skid Resistance of Paved Surfaces using a Full-

Scale Tire.”

### 5.3 STRUCTURAL CAPACITY

LA DOTD shall be satisfied that the structural capacity of the pavement will provide 20 years of satisfactory service. The structural capacity (thickness and strength) of pavement sections must be evaluated during the construction phase through the Design-Builder’s approved Quality Control (QC) program. The parameters that will be evaluated include thickness, flexural strength, and quality of materials. The thickness, strength, and quality of materials will be evaluated to ensure compliance with the approved design.

### 5.4 MATERIAL QUALITY

LA DOTD shall be satisfied that the materials used meet or exceed LA DOTD Standard Specifications. Material quality must be evaluated prior to and during construction through the Design-Builder’s approved QC program.

### 6.0 REQUIREMENTS

During construction, the Design-Builder shall achieve 95% base course density after compaction as per Louisiana Department of Transportation and Development's Standard Specifications for Roads and Bridges 2006 Edition.

#### 6.1 DESIGN

The Design-Builder shall design for both existing and new pavements which will include, but not be limited to, the following:

- A) Information on design criteria and methods;
- B) Details of materials/mixes to be used;
- C) Load transfer/contact/joint details between pavement types and repair details for existing pavement types;
- D) Patching/rehabilitation of existing pavements which remain in place with like materials and pavement types;
- E) Coefficients of thermal expansion between any new and old portland cement concrete structures shall be compatible with one another;
- F) Internal drainage of new aggregate base courses;
- G) A pavement design consisting of hot mix asphalt must have an open graded friction course (OGFC) as a wearing surface, which will also be carried across the existing travel lanes. If an OGFC is used, the existing pavement must be water blasted and cleaned immediately prior to the application of the overlay.

The following design matrix are examples of typical pavement sections that may be considered for use on this project:

<b>Matrix of Pavement Options for US 90 (New Construction)</b>
--



## Louisiana Department of Transportation and Development

---

	Rigid Pavement	Flexible Pavement
JPCP thickness (inches)	13*	-
SMA Wearing Course (inches)	-	2
Superpave AC Wearing Course (Level 2) (inches)	-	2
Superpave AC Binder Course (Level 2) (inches)		9
Class II Base Course (stone) (inches)	4	4
Class II Base Course (Soil Cement) (inches)	6	6

\*Based on Modulus of Rupture of 750 psi (appropriate testing would be required)

### 7.0 FINAL ACCEPTANCE

There will be no defects in any pavement structures constructed under this project at Final Acceptance.

**STRUCTURES  
PERFORMANCE SPECIFICATION**

**1.0 INTRODUCTION**

The Design-Builder shall design and construct permanent structures necessary for the new interchange facility at the intersection of US 90 and LA 85, such as grade separation, bridges, retaining walls, box culvert drainage structures, and any major overhead sign structures in accordance with the criteria established in this Structures Performance Specification.

The completed structures shall provide functionality, durability, ease of inspection and maintenance, safety, and pleasant aesthetics.

**2.0 PERFORMANCE GOALS**

- A) Provide a safe interchange facility for the traveling public.
- B) New structures shall provide a 75 year design life.
- C) Smooth ride for the traveling public transitioning from the roadway surface and bridge structure.
- D) Ease of access for long term inspection of superstructure, joints, bearings, etc.
- E) Structures preserve and enhance the environment.

**3.0 STANDARDS AND REFERENCES**

The design and construction of structures shall be in accordance with this Structures Performance Specification and the relevant requirements of the following standards, unless otherwise stipulated in this performance specification. Standards and references specifically cited in the body of the Structures Performance Specification establish requirements that shall have precedence over all others. Should the requirements in any standard conflict with those in another, the standard highest on the list shall govern. Listed under references are guidelines that the Design-Builder may use in addressing the requirements as the Design-Builder sees fit. It is the Design-Builder's responsibility to obtain clarification of any unresolved ambiguity prior to proceeding with design or construction. Items listed as standards or references in this Structures Performance Specification shall be the most recent version available at the time of issuance of the Scope of Services Package.

**3.1 STANDARDS**

- A) LA DOTD Design Standards for Freeways (F3 Roadway Classification);
- B) AASHTO LRFD Bridge Design Specifications, Fourth Edition, 2007, 2008 and 2009 Interims;
- C) LA DOTD LRFD Bridge Design Manual, First edition, including revisions and memorandums;
- D) LA DOTD Bridge Design Manual, Fourth English editions and revisions;
- E) LA DOTD Standard Plans and Standard Bridge Details;
- F) LA DOTD Permanent Sign Standard Details;
- G) AASHTO LRFD Bridge Construction Specifications, 2nd Edition with 2006, 2007, 2008, and 2009 Interims;

- H) AASHTO A Policy on Geometric Design of Highways and Streets, Fifth Edition, 2004;
- I) AASHTO/AWS D1.5M/D1.5:2008 Bridge Welding Code, with 2009 AASHTO Interim;
- J) AASHTO Manual for Bridge Evaluation, 1st Edition, 2008;
- K) LA DOTD, The policy and guidelines for Bridge Rating and Evaluation, March 3, 2009;
- L) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, 5th Edition, 2009;
- M) LA DOTD Standard Specifications for Roads and Bridges, 2006 Edition;
- N) LA DOTD Specifications for High Performance Concrete bridge members;
- O) FHWA Hydraulic Engineering Circular No. 21 “Design of Bridge Deck Drainage”; and
- P) LADOTD Software and Deliverable Standards for Electronic Plans. ([http://altivosoft.com/ladotd/PDFs/DOTD\\_Software\\_Standards\\_for\\_Electronic\\_Plans.pdf](http://altivosoft.com/ladotd/PDFs/DOTD_Software_Standards_for_Electronic_Plans.pdf)).

### **3.2 REFERENCES**

- A) AASHTO Guide Design Specifications for Bridge Temporary Works, latest edition with interims;
- B) NCHRP 445, Forces on Highway Bridges;
- C) ACI 305 R-99, Hot Weather Concreting;
- D) ACI 207.1 R-99, Mass Concrete;
- E) NCHRP Report 489, Design of Highway Bridges for Extreme Events, 2003;
- F) NCHRP Report 314, Guidelines for the Use of Weathering Steel in Bridges, 1989;
- G) The Environmental Documents and permits for the project; and
- H) AASHTO Construction Handbook for Bridge Temporary Works, latest edition with interims.

### **4.0 REQUIREMENTS**

#### **4.1 MATERIALS**

As a minimum, all materials shall satisfy the requirements listed in the LA DOTD Standard Specifications for Roads and Bridge, 2006 Edition. All materials not meeting Contract requirements will be addressed through the Non-Conformance Report procedures as outlined in the Contract Documents.

#### **4.2 DESIGN PARAMETERS**

##### **4.2.1 General**

The structures shall be designed and detailed using the customary English units. Structural design shall be in accordance with the AASHTO LRFD Bridge Design Specifications 4th edition 2007 with 2008 and 2009 interims and the LA DOTD LRFD Bridge Design Manual first edition. The LA DOTD Bridge Design English Manual fourth edition and any revisions and technical memoranda issued by the State Bridge Design Engineer prior to the issue date of the Scope of Services Package shall also be used. Plans shall be prepared in accordance with the LA DOTD Bridge Design English Manual, Chapter 1. All submittals and submittal requirements shall be as per the performance specifications. The LA DOTD Bridge Design Manuals and Technical Memorandums can be downloaded from the LA DOTD Bridge Section Website at: ([http://www.dotd.la.gov/highways/project\\_devel/design/home.asp?ID=BRIDGE](http://www.dotd.la.gov/highways/project_devel/design/home.asp?ID=BRIDGE))

#### 4.2.2 Loads And Forces

The following load factors shall be used for ductility and importance.

$$\eta_D, \text{ ductility} = 1.00$$

$$\eta_I, \text{ importance} = 1.05$$

For redundancy load factor,  $\eta_R$ , follow the LA DOTD LRFD Bridge Design manual to select the required load factor.

##### 4.2.2.1 Dead Loads

Add 12 psf unit dead load for a future wearing surface to all bridge structures except slab span structures. Add 19 psf for unit dead load for a future wearing surface for slab span bridges. Metal stay in place forms may be used on this project. If these forms are used, the additional dead load due to the stay in place forms shall be included in the design of the structure. The top 1/2" of the roadway concrete slab shall be considered non-structural and shall be accounted for as dead load.

##### 4.2.2.2 Live Loads

Bridges shall be designed for HL-93 vehicular live load. For fatigue use ADT and traffic data provided by LADOTD. The Louisiana Special Design Vehicles specified in Figure 3.1 of LADOTD LRFD Bridge Design Manual shall be included in the design for Strength II Limit State.

##### 4.2.2.3 Vehicle Collision Force

Unless protected according to Section 3.6.5 of AASHTO LRFD Bridge Design Specifications, the structures located within a distance of 30 feet to the edge of the roadway, shall be designed for an equivalent static load of 400 kips in accordance with Section 3.6.5.2 of AASHTO LRFD Bridge Design Specifications.

#### 4.2.3 Earthquake

The seismic performance category for all structures shall be Zone 1. The importance classification for all bridges shall be Critical.

#### 4.2.4 Bridge Load Rating

Load rate all new and existing bridges based on existing as-built conditions in accordance with the AASHTO Manual for Bridge Evaluation and the LA DOTD Policies and Guidelines for Bridge Rating and Evaluation. The Design-Builder shall submit the load rating prior to the final acceptance of the bridges.

### 4.3 CORROSION PROTECTION

The Design-Builder shall provide for review and approval by LA DOTD a Corrosion Control Plan including material selection modeling process and estimates of life-cycle costs, to assure the stated service lives for the structural elements of the bridges. Cathodic protection is not required.

For post-tensioned bridges, the Corrosion Protection Plan shall include specific detailed provisions for post-tensioning tendons corrosion protection. The plan shall specify corrosion allowances and outline detailed provisions with regards to reinforcing steel and structural steel protection. In regards to concrete performance, the plan shall assess the effects on concrete permeability, corrosion thresholds, corrosion rate, impacts on cracked concrete, time-to-repair and provide recommendations on the use of calcium nitrate, silica fume, sealers, membranes, reinforcing coatings, increased cover, corrosion inhibitors, etc.

#### **4.4 AESTHETICS**

At a minimum, bridge aesthetics shall meet the requirements of the LA DOTD Bridge Design Manual Chapter 3, Bridge Aesthetics. If weathering steel is used, the requirements listed in NCHRP, Report 314 should be followed.

#### **4.5 GEOMETRY**

The minimum typical section for the bridge structures shall consist of 2 – 12' travel lanes, 6 foot inside shoulder and 10 foot outside shoulder with 2.5% constant cross-slope.

New bridge construction shall meet the LA DOTD design standards. The required vertical clearance shall be 16'-6" and horizontal clearances shall be as per the LA DOTD Bridge Design English Manual, Chapter 3 Normal Highway Clearances. The required vertical clearance shall be a minimum of 16'-6" over the entire roadway width including any auxiliary lanes and usable width of shoulders.

The span arrangement for the new US 90 bridge will accommodate a future upgraded 5-lane section for LA 85.

#### **4.6 BRIDGE TYPE**

Bridge type will not be restricted to those traditionally used by the LA DOTD. Other types and components may be used, but will be allowed only if they have been accepted for general use by other United States transportation authorities and the Design-Builder can demonstrate that its design of the bridge type and components will perform according to these specifications.

Experimental bridge types, pre-cast concrete flat slab bridges, timber bridges, masonry bridges, and structural plate arches are not permitted..

The Design-Builder shall minimize the number of expansion joints through the use of continuous superstructure units.

#### **4.7 INSPECTION ACCESS**

All bridge superstructures, joints, and bearings shall be designed so as to provide easy access for long term inspection.

#### **4.8 HOT WEATHER CONCRETE**

Hot weather concrete shall be in accordance with ACI 305 R-99 Hot Weather Concreting.

#### **4.9 HURRICANE PREPAREDNESS**

The Design-Builder shall have a plan to address securing and protection of the project site during a hurricane event. The Design-Builder shall provide a copy of the plan within 90 days of NTP to LA DOTD for review and comment.

#### **4.10 COMPONENTS**

##### **4.10.1 Traffic Railing Barrier**

New bridge traffic railing barriers shall be a cast-in-place concrete barrier conforming to a TL-4 crash level. Bridge traffic railing barriers height shall be 32" minimum.

##### **4.10.2 Approach Slabs**

The Design-Builder shall provide a minimum 40'-0" long approach slab at the end of each bridge in accordance with the LA DOTD Bridge Design Manual. Any settlement of the approach slab shall be taken into consideration when designing the approach slab.

#### **4.10.3 Decks**

Decks shall be of concrete with a minimum deck thickness of 7.5 inches including 0.5 inch wearing surface, not to be included in the structure design. Empirical deck design method is not allowed. Pre-tensioned, pre-cast concrete deck forms may be used provided that a minimum of four inches of cast in place deck thickness is provided over the pre-cast deck forms. Open or filled grating decks and orthotropic decks are not permitted.

For new bridge decks, the IRI must be 95 in/mile IRI or less using the testing procedure described in LA DOTD's DOTD-TR 644-06.

In order to maintain adequate coverage of the top reinforcing steel in the bridge deck, the Design-Builder shall submit a remediation plan, if surface correction is required, to the Department's Project Manager for approval.

#### **4.10.4 Deck Joints**

Avoid or minimize joints wherever possible. Use only strip seal and finger joints. Strip seals can only be used for total movement not exceeding 3.5 inches. Movement greater than 3.5 inches shall use finger joints. Aluminum finger joints are permitted if fatigue requirements are met. Steel plate finger joints shall be hot dipped galvanized.

#### **4.10.5 Post-Tensioning**

All post-tensioning details and grouting operations shall be in accordance with current industry standards for detailing and grouting post-tensioning tendons, which meet or exceed the American Segmental Bridge Institute's recommended practices.

#### **4.10.6 Structural Steel**

Structural steel members shall be weathering steel. The design and details for preventing staining of concrete by weathering steel shall be in accordance with the LA DOTD Bridge Design manual, Chapter 5, Subsection for guidelines for Weathering Steel Design. All bolted steel connections shall use Direct Tension Indicators.

#### **4.10.7 Bearings**

Design and location of bearings shall provide for maintenance accessibility and future replacement. Elastomeric bearings are preferred.

#### **4.10.8 Pier Caps**

The type of pier cap shall be consistent with the bridge system and shall meet the aesthetic requirements of the LA DOTD Bridge Design Manual Chapter 3, Bridge Aesthetics.

#### **4.10.9 Embankment Slope Protection**

Embankment slope protection shall be in accordance with the details contained in the LA DOTD's Bridge Design English Manual, Chapter 6, Embankment protection and shall be consistent with the bridge hydraulic analysis and permits. Cast-in-place concrete revetment shall be provided in accordance with LA DOTD Standard Plan CR-01.

#### **4.10.10 Foundations**

Maximum pile load demands shall be determined using the AASHTO LRFD Bridge Design Specifications. The structural capacity of the foundation elements shall be designed per LRFD Specifications for all required LRFD load combinations.

Foundations shall be designed in accordance with AASHTO LRFD Bridge Design Specifications, LA DOTD Bridge Design English Manual, LADOTD LRFD Bridge Design Manual and Geotechnical Performance Specification in this Scope of Services Package. Spread footings and timber piles are not permitted. No exposed steel piles will be allowed above ground elevation.

#### **4.10.11 Deck Drainage**

The deck drainage shall be based on hydrologic analysis and satisfy all permit requirements. Deck drains shall extend a minimum of 12 inches below the bottom of steel girders. This requirement is not applicable to concrete girders. Avoid drainage over existing and proposed roadways and railroad right-of-ways.

The deck drainage shall be in accordance with FHWA Hydraulic Engineering Circular no. 21 “Design of Bridge Deck Drainage”.

#### **4.10.12 Retaining Walls**

Retaining walls shall be designed in accordance with Geotechnical Performance Specifications.

#### **4.10.13 Abutment**

Front slopes shall be 4:1 (H:V) or flatter.

### **4.11 MAJOR DRAINAGE STRUCTURES**

Major drainage structures shall be designed in accordance with AASHTO LRFD Bridge Design Specification.

### **4.12 PERMANENT SIGN STRUCTURES**

Sign structures and supports shall be designed in accordance with the LA DOTD’s Bridge Design English Manual, Chapter 10, Permanent Signing and the latest edition of the AASHTO Standard specifications of Structural Supports of Highway Signs, Luminaries and Traffic Signals. It is preferred that the LA DOTD standard sign details be used for the project. The LA DOTD preferred overhead standard sign detail is based on a 4 chorded pipe box truss. Completed designs for the LA DOTD sign structures are available upon request based on the contractor supplying the span lengths and sign panel areas.

### **4.13 GUARDRAIL**

The guard rail shall be designed and replaced in accordance with the LA DOTD guard rail Standard plans. Abutment-Front slopes shall be 4:1 (H:V) or flatter.

## **5.0 FINAL SUBMITTALS**

### **5.1 PLANS**

Final plans shall be signed and sealed by a Licensed Professional Engineer registered in the State of Louisiana. The Design-Builder shall produce electronic final plan deliverables in conformance with “DOTD Software and Deliverable Standards for Electronic Plans”.

### **5.2 CALCULATIONS FOR FINAL DESIGN AND BRIDGE RATING**

The Design-Builder shall submit all design calculations in an electronic .pdf file. The design calculations shall include a table of contents, design criteria and design assumptions. Reference computer programs input and output files and the appropriate code sections in the calculations. All computer program input and output files shall be submitted with the calculations. All calculations shall be signed by the designer and the reviewer. The bridge rating shall use the Virtis Software and the rating calculations shall be

## Louisiana Department of Transportation and Development

---

submitted in accordance with LADOTD The Policy and Guidelines for Bridge Rating and Evaluation. Final design calculations and rating calculations shall be signed and sealed by a Licensed Professional Engineer registered in the State of Louisiana.



## **TRAFFIC MANAGEMENT PLAN PERFORMANCE SPECIFICATION**

### **1.0 INTRODUCTION**

The Design-Builder shall implement a Traffic Management Plan for this Project that meets or exceeds the Performance Goals and Measures as outline in this Specification. It is the Design-Builder's responsibility to obtain clarification of any unresolved ambiguity prior to proceeding with design or construction.

### **2.0 PERFORMANCE GOALS**

- A) Provide a Traffic Management Plan (TMP) that maintains or improves safe traffic flows through the project limits for the duration of the Project.
- B) No injury or loss of life to the Public or Design-Builder's workforce.
- C) Minimize & Mitigate Liability with traffic-related incidents.
- D) No Claims as a result of traffic operations for the duration of the Project.
- E) Expeditious handling of incident and emergency operations.

### **3.0 STANDARDS AND REFERENCES**

The Design-Builder shall plan, design, and construct pavement structures in accordance with this Traffic Management Plan Performance Specification and the requirements of the following standards. Standards and references specifically cited in the body of this Traffic Management Plan Performance Specification establish requirements that have precedence over all others. In this Pavement Structure Performance Specification, if the requirements in any standard conflict with those in another, the standard highest on the list will govern. Listed under references are guidelines that the Design-Builder may use in addressing the requirements as the Design-Builder sees fit. It is the Design Builder's responsibility to obtain clarification of any ambiguity within this Traffic Management Plan Performance Specification prior to proceeding with design or construction.

#### **3.1 STANDARDS**

- A) LA DOTD Standard Specification for Roads and Bridges 2006, Section 713
- B) LA DOTD Temporary Traffic Control Details (TC-00 – TC-19)
- C) Manual of Uniform Traffic Control Devices (MUTCD)
- D) Design-Builder's own Standard Special Provisions and Specifications
- E) LA DOTD EDSM No. V1. 1.1.4

#### **3.2 REFERENCES**

- A) LA DOTD Highway Design Manual
- B) AASHTO Roadside Design Guide, 2002
- C) LA DOTD Traffic Signal Details (TSD-00 – TSD-10)
- D) LA DOTD Qualified Products List (QPL)
- E) MUTCD Standard Highway Signs Policy
- F) LA DOTD Public Convenience Specifications
- G) National Cooperative Highway Research Board (NCHRP) Report 350
- H) ATSSA “Quality Guideline for Work Zone Traffic Control Devices”

#### **4.0 SCOPE**

The Design-Builder shall plan, design, construct and implement temporary traffic control measures that provide a safe construction work zone while simultaneously maintaining traffic flow through the project limits for the duration of the Project. The Design-Builder shall also provide documentation for the mitigation of accident litigation.

#### **5.0 PERFORMANCE MEASURES**

- A) Management and inspection of traffic control activities.
- B) Protection and adequate guidance for traffic control during construction.
- C) Traffic control operations within the Project Site during construction and periods of suspension of the Work, particularly at intersections with State or local highways and Interstate Accesses.
- D) Placement, condition, maintenance and protection of traffic control devices (TCD).
- E) Traffic control methods relating to access to private and public properties within the Project Site.
- F) Traffic control operations related to Incident and Emergency activities (including hurricane evacuation and contra-flow as applicable).
- G) Quality control of submittals
- H) Modeling and model updating

#### **6.0 REQUIREMENTS**

The Design-Builder will be required, for potential litigation and claims purposes, to provide a Mitigation and Limitation of Liability/Claims Plan (M&LP).

**6.1 M&LP EVALUATION CRITERIA**

- A) Documentation of on-site conditions
- B) Qualifications of traffic control supervisors and technicians
- C) Accident investigation documentation (written and visual)
- D) Responsibility and authority assignments
- E) Submittals for permanent records (written and visual)

**6.2 DESIGN-BUILDER'S RESPONSIBILITIES (EXECLUSIVE OF M&LP)**

- A) Properly supervise the implementation, maintenance and Inspection of Traffic Control Plan (TCP) measures and details, through certified and accepted Traffic Control Supervisors (TCSs) and Traffic Control Technicians (TCTs).
- B) Record crash details; time and date of notification; take photos at the scene; video the project signs in the approach direction and provide to the Design Builder PM and LA DOTD PM.
- C) Perform daily video of the project signage prior to starting work and changes at work locations.
- D) Perform night video of project signage once per week.
- E) Provide weekly reports certifying adherence to the Design-Builder's TMP and that all traffic controls meet the standards.
- F) The Design-Builder Quality Control (DBQC) will review and certify that the TMP has been checked and meets all contract requirements.
- G) Provide daily Traffic control inspection reports.
- H) Provide TMP Diary(ies) and Project Video(s).
- I) Provide TMP Details and Inspection frequency.
- J) Provide copies of the TMP Diary(ies) with the Monthly Progress Report.
- K) Provide Motorist Assistance Patrol (MAP) services within the limits of the Project while traffic control measures are in place.

## PERMANENT SIGNAGE PERFORMANCE SPECIFICATION

### 1.0 INTRODUCTION

The Design-Builder shall design, prepare plans, and install all signs, including, new signs and modifications to existing sign panels and structures, necessary for the safe traffic operations of the final widened roadway. It is the Design-Builder's responsibility to obtain clarification of any unresolved ambiguity prior to proceeding with design or construction.

### 2.0 PERFORMANCE GOALS

The Design-Builder shall meet the following performance goals, in the sole discretion of the LA DOTD:

- A) Permanent signage that provides for safe and efficient traffic flow and operations;
- B) A permanent signing plan that is easily understood by the traveling public;
- C) A permanent signing plan that follows LA DOTD and national transportation standards; and
- D) Unobstructed views of permanent signs.

### 3.0 STANDARDS AND REFERENCES

The Design-Builder shall plan, design, and install permanent signage in accordance with this Permanent Signage Performance Specification and the requirements of the following standards. Standards and references specifically cited in the body of this Permanent Signage Performance Specification establish requirements that have precedence over all others. In this Permanent Signage Performance Specification, if the requirements in any standard conflict with those in another, the standard highest on the list will govern. Listed under references are guidelines that the Design-Builder may use in addressing the requirements as the Design-Builder sees fit. It is the Design Builder's responsibility to obtain clarification of any ambiguity within this Permanent Signage Performance Specification prior to proceeding with design or construction.

#### 3.1 STANDARDS

The standard for this Permanent Signage Performance Specification is the Manual of Uniform Traffic Control Devices (MUTCD).

#### 3.2 REFERENCES

The version of the following references in effect on the Proposal due date may apply:

- A) The Louisiana Department of Transportation and Development's Standard Signing Details;
- B) The Louisiana Department of Transportation and Development's Bridge Design Manual; and
- C) AASHTO Roadside Design Guide.

### 4.0 SCOPE

The signing design must 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 must be located and installed in a manner that avoids

conflicts with other signs, vegetation, DMS, lighting, and structures. The Design-Builder shall ensure that signs are clearly visible, provide clear direction and information for users, and comply with all applicable MUTCD requirements.

**5.0 PERFORMANCE MEASURES**

LA DOTD shall be satisfied that the permanent signing plan will meet the performance goals.

**6.0 REQUIREMENTS**

All new signs, including traffic generators, and modifications of existing sign text will be submitted to the LA DOTD for review and comment prior to installation.

**ENVIRONMENTAL  
PERFORMANCE SPECIFICATION**

**1.0 INTRODUCTION**

This Environmental Performance Specification specifies general roles and responsibilities. Other than identified in Section 4.2, the LA DOTD will be responsible for obtaining all environmental permits required for this Project. The Design-Builder shall prepare its design and conduct its construction activities in accordance with this Environmental Performance Specification such that no action or inaction on the part of the Design-Builder shall result in non-compliance with state or federal environmental laws, regulations, and Executive Orders, including, but not limited to, the Clean Water Act, Sections 401, 402, and 404, as amended; the Clean Air Act, as amended; the Endangered Species Act, as amended; Section 106 of the National Historic Preservation Act, as amended; the State and Local Coastal Resources Management Act, as amended; and Title VI of the Civil Rights Act, as amended. It is the Design-Builder's responsibility to obtain clarification of any unresolved ambiguity prior to proceeding with design or construction.

**2.0 PERFORMANCE GOALS**

The Design-Builder shall meet the following performance goals, in the sole discretion of the LA DOTD:

- A) Environmentally friendly highway design and construction;
- B) Adherence/compliance with all environmental permits and their conditions throughout the life of the Project; and
- C) Minimization of impacts to the natural and social environment.

**3.0 STANDARDS AND REFERENCES**

The Design-Builder shall plan, design, construct, and implement the Work in accordance with this Environmental Performance Specification and the requirements of the following standards. Standards specifically cited in the body of this Environmental Performance Specification establish requirements that have precedence over all others. In this Performance Specification, if the requirements in any standard conflict with those in another, the standard highest on the list will govern. It is the Design Builder's responsibility to obtain clarification of any ambiguity within this Environmental Performance Specification prior to proceeding with design or construction.

**3.1 STANDARDS**

- A) The terms and conditions listed in the United States Army Corps of Engineers' (USACOE) Sections 10/404 permits; and
- B) The Louisiana Department of Transportation and Development's Standard Specifications for Roads and Bridges 2006 Edition, with specific reference to Section 204.

**3.2 REFERENCES**

Not Applicable

**4.0 SCOPE**

**4.1 GENERAL PHILOSOPHY**

The philosophy followed by the LA DOTD during the development of the Project is to avoid and minimize impacts to the natural and human environments to the extent feasible and practical. The Design-Builder shall continue this approach and philosophy during the preparation of design plans and through

Project implementation and construction.

#### **4.2 GENERAL ROLES AND RESPONSIBILITIES**

The LA DOTD is responsible for obtaining the environmental permits (referenced below) for the new interchange at US 90/LA 85 in Iberia Parish. The scope of work for which the permit applications were submitted calls for the construction of additional lanes within the existing Right-of-Way (ROW). For this concept, the LA DOTD will provide the cultural resource concurrence letter from the State Historic Preservation Office (SHPO); the U. S. Army Corps of Engineers, Section 23 Nationwide Permit; the Department of Environmental Quality Clean Water Act Section 401, Water Quality Certification; and the Department of Environmental Quality Clean Water Act Section 402, Storm Water permit (Louisiana Pollutant Discharge Elimination System (LPDES) Storm Water General Permit for Construction Activities). All other permits and clearances are the responsibility of the Design-Builder.

Material changes to the original concept or highway alignment that result in environmental, cultural, or community impacts beyond those identified in the original permits will not be allowed without the prior written consent of the LA DOTD. All changes must be supported by the necessary investigations, documentation, and approvals of applicable resource management and permitting agencies. The Design-Builder is responsible for all work effort and document preparation required to obtain all necessary approvals, permits, or permit modifications prior to implementing any scope changes.

Any work performed by the Design-Builder that is determined by the LA DOTD or any relevant governmental agency to be outside the scope of the permits must be performed at the Design-Builder's own risk, including any additional environmental work, studies, reports, assessments, or permits that must be completed.

The Design-Builder shall be responsible for obtaining the necessary environmental and cultural resources permits and/or clearances for all construction related activities such as, but not limited to, material pits, staging yards, and haul roads that are located outside the scope of the original permits. The Design-Builder is responsible for ensuring that all required permits are obtained from the appropriate entities prior to implementing any work requiring such a permit.

#### **5.0 PERFORMANCE MEASURES**

LA DOTD shall be satisfied that the design and construction meet all of the environmental performance goals, as well as all requirements as outlined and specified in the permits.

#### **6.0 REQUIREMENTS**

##### **6.1 MITIGATION MEASURES AND COMMITMENTS**

The mitigation measures and Project commitments included in the original permits must be incorporated in the Design-Builder's plans and Project Specifications and implemented as part of Project construction. The specific mitigation measures and commitments to be implemented by the Design-Builder are listed in Sections 6.1.1 through 6.1.4.

##### **6.1.1 Threatened and Endangered Species Protection Plan**

The proposed Project is not likely to adversely affect the any threatened or endangered species. The Design-Builder shall adhere to the erosion control measures outlined in the Louisiana Standard Specifications for Roads and Bridges 2006 Edition to ensure water quality impacts are confined to the immediate Project area.

##### **6.1.2 Wetland and Coastal Use Mitigation**

The LA DOTD will obtain a Water Quality Certification from the Louisiana Department of

Environmental Quality and a Section 23 Nationwide permit from the USACOE for impacts to jurisdictional wetlands and other waters of the US for the Project. The Design-Builder shall adhere to the terms and conditions of these permits. The LA DOTD will contract with private sector mitigation banks to execute compensatory mitigation in the amount required by the New Orleans District, USACOE.

The Louisiana Department of Natural Resources' current position is that a Coastal Use Permit is not necessary for this Project.

If the Design-Builder changes the scope of Work in a manner that requires a new permit or an amendment or modification to an existing permit, the Design-Builder shall obtain the new permit, amendment, or modification. Any fees or compensatory mitigation required by the permitting agencies will be the responsibility of the Design-Builder.

If the Design-Builder discovers an additional need for ROW as it selects borrow, staging, or other Project-related sites, the Design-Builder shall comply with all environmental laws and regulations and obtain the necessary approvals and permits. If the use of additional ROW requires a modification to the existing permits obtained by the LA DOTD, the Design-Builder shall obtain the required modifications. Any fees or compensatory mitigation required by the permitting agencies will be the responsibility of the Design-Builder.

### **6.1.3 Water Quality and Storm Water**

The LA DOTD will be responsible for obtaining the Section 401 (Water Quality Certification) and 402 (LPDES Storm Water General) permits from the Louisiana Department of Environmental Quality. **As part of the Section 402 permit requirements, the Design-Builder shall prepare a Storm Water Pollution Prevention Plan (SWPPP).** This SWPPP must incorporate Best Management Practices (BMPs) for spill prevention, erosion control, and sediment control. The Design-Builder shall follow all applicable rules and regulations including, but not limited to, maintaining a copy of the LPDES permit and SWPPP on the construction site.

### **6.1.4 Cultural Resources**

If archaeological sites or historic artifacts are encountered during construction, the Design-Builder will notify the LA DOTD immediately and comply with the provisions of Contract Documents, Part 2 – Design-Build (DB) Section 100, DB Section 107-26.



**UTILITIES  
PERFORMANCE SPECIFICATION**

**1.0 INTRODUCTION**

The Design-Builder (D-B) may choose to design around existing utility lines where not restricted elsewhere; otherwise the D-B will be responsible for resolving the relocation of any utility conflicts in accordance to LADOTD policies and procedures so that there is no loss of service during the contract period.

**2.0 PERFORMANCE GOALS**

- A) Design that avoids all utility conflicts;
- B) Construction methods that ensure existing utilities are not disrupted.

**3.0 STANDARDS AND REFERENCES**

The relocation of utility lines conflicting with the construction of the project shall be done in accordance with this Utility Relocation Performance Specification and the relevant requirements of the following standards, unless otherwise stipulated in this performance specification. Standards and references specifically cited in the body of the Utility Relocation Performance Specification establish requirements that shall have precedence over all others. Standards listed are placed in the descending order of precedence. In case of conflict between or among standards listed, the order of precedence established by the LADOTD shall govern. Listed under references are guidelines that the Design-Builder may use in addressing the requirements as the Design-Builder sees fit. It is the Design-Builder's responsibility to obtain clarification of any unresolved ambiguity prior to proceeding with design or construction.

**3.1 STANDARDS**

The standards for this Utility Performance Specification are listed in descending order of precedence. In case of conflict between or among standards, the order of precedence established by the LA DOTD will govern.

- A) Louisiana Revised Statute 48:381.; and
- B) Louisiana Administrative Code, Title 70 – Transportation, Part II – Utilities.
- C) “ASCE Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.”; CI/ASCE 38-02.
- D) LADOTD “Standards Manual for Accommodating Utilities, Driveways and Other Facilities on Highway Right-of-Way”; September 1, 1994 edition.

**3.2 REFERENCES**

The version of the following references in effect on the Proposal due date may apply:

A) Part I – General Provisions; Section 105.06: Cooperation with Utilities

- 1) Throughout. References to any mentioned action of duties by “the Department” shall be changed to refer to the “LADOTD’s representative/Design-Builder”.
- 2) Throughout. References to acceptance by “the Department” still remains “the Department”.

B) Part I – General Provisions; Section 107.20: Utility Property and Services

- 1) Throughout. References to any mention of “contractor” shall be changed to refer to the “LADOTD’s representative/Design-Builder”.

#### **4.0 SCOPE**

It is not anticipated that there will be any utility conflicts within the scope and limits of this Project. However, if the DB should encounter any conflicts between the existing facilities and the proposed design and/or construction, the DB shall follow the standards as outlined in this Performance Specification.

#### **5.0 PERFORMANCE MEASURES**

LA DOTD shall be satisfied that utility avoidance or relocation plan and its execution meets the stated performance goals.

#### **6.0 REQUIREMENTS**

##### **6.1 EXISTING UTILITY LINES**

The Design-Builder is responsible for gathering any additional information as may be required to determine any conflicts between utility lines and the scope of the project.

Utility lines may remain in their existing locations within the project R/W if the existing location will not adversely affect the construction, operation, safety, maintenance and/or use of the project.

##### **6.2 RELOCATION OF UTILITY LINES**

###### **6.2.1 Coordination**

If utility relocation is required, the Design-Builder shall communicate, cooperate, and coordinate with LADOTD, the Utility Owners and potentially affected third parties, as necessary for performance of the Utility Relocation Work.

When utility lines are to be relocated, the D-B shall coordinate with the Utility Owner to determine which of the following three options will be utilized:

- A) The Utility Owner produces the design of the relocation of the utility line and also physically relocates the line themselves.

- B) The Utility Owner produces the design of the relocation of the utility line and the D-B physically relocates the line.
- C) The D-B produces the design of the relocation of the utility line, and then after the Utility Owner approves the design, the D-B physically relocates the line.

In Cases B and C above, the D-B is to allow and/or provide the Utility Owner inspection of the construction of relocating the utility line. The D-B will work with the Utility Owner on a mutually agreed upon written procedure for the Utility Owner to notify the D-B of any unacceptable work in the construction of the relocation of the utility line. The D-B is to ensure complete satisfaction of the Utility Owner in the relocation of the utility line so that the Utility Owner will accept the utility line and responsibility for maintenance and upkeep to the utility line once it has been relocated.

The Design-Builder is notified to comply with any state and federal laws/codes governing the design and construction of a utility line.

### **6.2.2 Agreements & Permits**

The LADOTD will not become owner or responsible for maintenance and upkeep of any utility line from a previous Utility Owner that must be relocated.

The Design-Builder shall be responsible for coordinating all efforts in the relocation of any utility lines located within the LADOTD right-of-way that are in conflict with the construction of the project, including the verification of existing lines, and preparing (unless prepared by the utility Owner) and securing execution (by the Department and the Utility Owner) of all necessary agreements and permits for such relocation.

The LADOTD requires agreements and/or permits between the Utility Owner and the Department for the following situations:

- A) An agreement is required whenever a utility line located within LADOTD right-of-way is required to be relocated. In this agreement, the cost distribution and responsibility of the work to be done is specified.
- B) The LADOTD requires a permit whenever a utility line is to be relocated inside the LADOTD right-of-way.
- C) An agreement is required if the Utility Owner relocates their utility line outside of the LADOTD right-of-way stating that the utility line will be moved to private property and includes the cost distribution required between the Department and Utility Owner.

The said agreements and/or permits must be approved and signed by the Utility Owner and LADOTD Utility Relocation Engineer prior to taking effect.

### **6.2.3 Status**

The Design-Builder is responsible of providing written documentation to the LADOTD Headquarters Utility Relocation Section of any written agreements and procedures affecting the utilities on the project.

**7.0 COST OF RELOCATING UTILITY LINES**

**7.1 PRIOR RIGHTS**

When a Utility Owner can produce documents indicating prior rights, as per the LA Administrative Code, Title 70, the cost of relocating that portion of the Utility Owner's line will be paid out of the Design-Builder's funds for this project.

**7.2 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. All betterments will be at 100% the Utility Owner cost, regardless of location.

## MICROWAVE TOWER RELOCATION PERFORMANCE SPECIFICATION

### 1.0 INTRODUCTION

The Design-Builder shall provide a new communications tower to replace the existing tower that is near the US 90 intersection with LA 85. The existing tower will be removed as part of the Project. The Design-Builder will perform the new tower design, fabrication, and installation, and the removal of the existing tower so as to meet or exceed the performance goals and measures as outlined in this Microwave Tower Relocation Performance Specification.

### 2.0 PERFORMANCE GOALS

The Design-Builder shall meet the following performance goals:

- A) Provide the design, fabrication and installation of a 350' self-supported tower with necessary equipment and appurtenances, and a communications building (12'x28') sufficient for the Department's communications needs ;
- B) Provide the necessary site preparation, foundation installation, grounding, fencing, finish grading, etc. necessary for a safe, well functioning, and secure communications tower facility;
- C) Provide lighting and alarm systems as required for the safe operation of the tower, including those required by the U.S. Department of Transportation, Federal Aviation Administration (FAA).
- D) Assure that all requirements of the Federal Communications Commission (FCC) regarding the function of the communication tower and potential conflicts with other communications facilities are met.
- E) Remove the existing guyed radio tower at the US 90/LA 85 intersection in Jeanerette, Louisiana. Existing tower components, beacon, lighting, Bogner antennas and transmission lines will be removed and returned to the LA DOTD.
- F) Uninterrupted service for the tower function.

### 3.0 STANDARDS AND REFERENCES

The Design-Builder shall plan, design, fabricate, and install/construct the new self-supporting communications tower, and dismantle the existing guyed radio tower in accordance with this Microwave Tower Relocation Performance Specification and the requirements of the following standards. Standards and references specifically cited in the body of this Microwave Tower Relocation Performance Specification establish requirements that have precedence over all

others. In this Microwave Tower Relocation Performance Specification, if the requirements in any standard conflict with those in another, the standard highest on the list will govern. Listed under references are guidelines that the Design-Builder may use in addressing the requirements as the Design-Builder sees fit. It is the Design Builder's responsibility to obtain clarification of any ambiguity within this Microwave Tower Relocation Performance Specification prior to proceeding with design or construction of the new tower, or dismantling of the existing tower.

### **3.1 STANDARDS**

The standards for this Microwave Tower Relocation Performance Specification are listed in descending order of precedence. In case of conflict between or among standards, the order of precedence established by the Louisiana Department of Transportation and Development (LA DOTD) will govern.

- A) U.S. Federal Communications Commission regulations and requirements;
- B) U.S. Department of Transportation , Federal Aviation Administration regulations and requirements – specifically including FAA Advisory Circular, 70/7460-1H, Change 2, Obstruction Marking and Lighting, dated September 1, 1992 and required by Part 17 of the Rules Section 303Q of the Federal Communications Act of 1934.
- C) ANSI/EIA/TIA – 222 – G1, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures.
- D) LA DOTD Bridge Design Manual, 4<sup>th</sup> Edition.

### **3.2 REFERENCES**

The version of the following references in effect on the Proposal due date may apply:

- A) The Louisiana Department of Transportation and Development's Standard Specifications for Road and Bridge Construction, dated 2006;
- B) Federal Highway Administration Drilled Shaft Installation Manual; and
- C) Engineering Directives and Standards Manual (EDSM), LA DOTD.

### **4.0 SCOPE**

The Design-Builder will provide a new 350' tall self-supported communication tower at the following approximate location: Latitude N 29° 55' 14", Longitude W 91° 43' 41". The Design-Builder will prepare and submit complete specifications for the work to be performed for approval by the LA DOTD before commencing work on the tower facility. Following LA DOTD approval of the specifications of the work to be performed, the Design-Builder will be responsible for the planning, design, fabrication, installation and construction of the new tower.

This work will include everything necessary to provide the LA DOTD with a functioning microwave tower that will withstand wind loadings up to 120 miles per hour. Some of the work items anticipated include the following: the tower foundation, the 350' tall self-supported tower itself, microwave antenna systems (including 3 new antennas and 2 new tower mounted amplifiers), tower lighting, cabling (including 5 antenna lines), grounding, fencing, communications building and generator on a raised platform, site preparation and finished grading.

The Design-Builder will also be responsible for dismantling the existing 350' tall guyed radio tower near the intersection of US 90 and LA 85 in Jeanerette, LA. Prior to dismantling the existing tower the beacon, tower lighting system, 2 Bogner antennas, and transmission lines (neatly rolled) will be removed. The dismantled tower components, lighting systems, antennas and transmission lines will be delivered to the LA DOTD by the Design-Builder.

## **5.0 PERFORMANCE MEASURES**

The performance measures for the tower are provided in a draft technical specification for the new self-supported communications tower and the dismantling the existing guyed tower prepared by the LA DOTD and transmitted to LA DOTD Project Manager, Ryan Reviere, P.E. on May 5, 2009 (*referenced as Tower Relocation (US 90 at LA 85) SPN 424-04-0032*) and attached to this Microwave Tower Relocation Performance Specification for reference and use.

The Design-Builder will assure that the tower is constructed such that the structural members are set accurately to the lines and elevations indicated on the erection drawings. Any necessary alignment and adjustment of the members will be performed before permanently fastening.

The Design-Builder will assure that tower plumbness is maintained during all phases of the erection work. Once the tower is completely erected and all equipment is mounted, the Design-Builder will perform a final check of plumbness and tower geometry and provide documentation substantiating that as-built conditions are within the allowable tolerances shown in the final design and erection plans.

## **6.0 REQUIREMENTS**

The Design-Builder will coordinate installation of the new tower and dismantling of the old tower so that there is no disruption of tower function and service. The Design-Builder will provide all personnel, supervision, tools, equipment and transportation to completed all the work associated with providing the new self-supported tower and dismantling the existing guyed tower. This will include a dedicated, full-time field supervisor assigned to the Project and available through all phases of the tower construction/dismantling activities. This supervisor will be subject to the approval of the LA DOTD. The tower construction supervisor's responsibilities will include, but will not be limited to the following: verification of the location and orientation of the facility with the LA DOTD, delivery and erection of the tower, inspection of joint

**Louisiana Department of Transportation and Development**

---

connections, and overall verification that the tower is constructed within the tolerances provided in the final design and erection drawings.

The Design-Builder will obtain and pay for all necessary local construction permits.

The Design-Builder will strictly adhere to Fall-Safe practices while working above 5 feet on the towers (new and existing), and will adhere to all applicable OSHA requirements.



**MAINTENANCE DURING CONSTRUCTION  
PERFORMANCE SPECIFICATION**

**1.0 INTRODUCTION**

The Design-Builder shall implement a Maintenance Plan for the existing US 90 and LA 85 highways in the project corridor that meets or exceeds the performance goals and measures as outlined in this Maintenance During Construction Performance Specification.

**2.0 PERFORMANCE GOALS**

The Design-Builder shall meet the following performance goals:

- A) The roadway and shoulders, including pavement, must be maintained in a safe, smooth, debris free condition which allows for traffic use as intended;
- B) All roadside features, appurtenances, and devices, including, but not limited to, drainage structures, guard rail, and permanent signs must be maintained in a manner that allows these items to function as intended;
- C) The roadside vegetation must be maintained in a manner that allows the side slopes, end slopes, and ditches to function as intended and provide a pleasing aesthetic appearance which does not impede drainage or any other function of roadside features, appurtenances, or devices; and
- D) Litter and other roadside debris must be managed to maintain a pleasing, aesthetic appearance and to allow for the safe movement of traffic.

**3.0 STANDARDS AND REFERENCES**

The Design-Builder shall plan, design, construct, and implement drainage in accordance with this Maintenance During Construction Performance Specification and the requirements of the following standards. Standards and references specifically cited in the body of this Maintenance During Construction Performance Specification establish requirements that have precedence over all others. In this Maintenance During Construction Performance Specification, if the requirements in any standard conflict with those in another, the standard highest on the list will govern. Listed under references are guidelines that the Design-Builder may use in addressing the requirements as the Design-Builder sees fit. It is the Design Builder's responsibility to obtain clarification of any ambiguity within this Maintenance During Construction Performance Specification prior to proceeding with design or construction.

**3.1 STANDARDS**

The standards for this Maintenance During Construction Performance Specification are listed in descending order of precedence. In case of conflict between or among standards, the order of precedence established by the LA DOTD will govern.

- A) Manual for Uniform Traffic Control Devices (MUTCD), (2003 with Revisions 1 and 2); and
- B) The Louisiana Department of Transportation and Development's Guardrail Design Standards (GR-200 and GR-0201).

**3.2 REFERENCES**

The version of the following references in effect on the Proposal due date may apply:

- A) The Louisiana Department of Transportation and Development's Maintenance Manual. (LA DOTD Maintenance is currently revising this manual. If version REV. JULY 1, 1986 of this manual is used, disregard page M6-16 ;
- B) The American Association of State Highway and Transportations Officials' (AASHTO) Maintenance Manual for Roadways and Bridges (2007);
- C) The Louisiana Department of Transportation and Development's Policy for Roadside Vegetation Management;
- D) The American Association of State Highway and Transportation Official's Roadside Design Guide 3rd Edition 2006; and
- E) Engineering Directives and Standards Manual (EDSM), LA DOTD.

#### **4.0 SCOPE**

Within the Project limits, the Design-Builder shall provide all necessary maintenance of the existing US 90 and LA 85 roadways, service roads, frontage roads, and all associated roadside features, including, but not limited to, permanent signs guardrail, vegetation, and drainage structures for the duration of the Design-Build (DB) Contract.

#### **5.0 PERFORMANCE MEASURES**

The Design-Builder's performance will be evaluated in accordance with the measures identified in Sections 5.1 through 5.7 below.

##### **5.1 PAVEMENT (TRAVEL LANES AND SHOULDERS)**

The following measures will be used to evaluate pavement maintenance during construction:

- A) Surface defects;
- B) Drainage aspects;
- C) Pavement and shoulder edge conditions;
- D) Rutting;
- E) Joints and cracking;
- F) Ride quality;
- G) Friction;
- H) Timeliness of repair strategy; and
- I) Debris removal.

##### **5.2 PIPES, CULVERTS, AND MISCELLANEOUS DRAINAGE STRUCTURES (SUCH AS, CATCH BASINS, DROP INLETS AND MEDIAN DRAINS)**

The following measures will be used to evaluate pipe, culvert, and miscellaneous structure maintenance during construction:

- A) Effectiveness and function;
- B) Debris/vegetation;
- C) Erosion/scour;

- D) Structural condition; and
- E) Flooding.

### 5.3 RETAINING WALLS

The following measures will be used to evaluate retaining wall maintenance during construction:

- A) Effectiveness and function;
- B) Debris/vegetation;
- C) Erosion/scour; and
- D) Structural condition.

### 5.4 GUARDRAIL

The following measures will be used to evaluate guardrail maintenance during construction:

- A) Effectiveness and function; and
- B) Timeliness of repair strategy.

Approval for repairs and/or replacement of guardrail must be obtained from the Department's Project Manager prior to Work being performed.

### 5.5 PERMANENT SIGNS

The following measures will be used to evaluate permanent sign maintenance during construction:

- A) Visibility and legibility during daytime and nighttime;
- B) Timeliness of repair strategy;
- C) Functionality; and
- D) Debris.

### 5.6 ROADSIDE VEGETATION

The following measures will be used to evaluate roadside vegetation maintenance during construction:

- A) Maintenance of primary turf height;
- B) Landscaped areas and all other roadside vegetation; and
- C) Control of noxious weeds and the collection/disposal of litter.

## 6.0 REQUIREMENTS

### 6.1 LICENSES AND SPECIAL TRAINING

#### A) Pesticide Applicator

The Design-Builder shall possess, or employ a person who possesses, a Louisiana Department of Agriculture and Forestry (LD&F) Commercial Pesticide Applicator License, within the Right-of-Way (ROW) usage and turf and ornamental category, to apply pesticide/herbicide within the highway system, as required. The Design-Builder shall provide the LA DOTD with documentation of the Commercial Pesticide Applicator License prior to beginning Work. Mixing, transporting, handling, spraying, and disposal of materials must be done by licensed personnel.

B) Aquatic License

The Design-Builder shall possess an aquatic license to make pesticide applications to target species located in bodies of water.