

STATE OF DELAWARE



DEPARTMENT OF TRANSPORTATION

DESIGN-BUILD PROJECT

for

INDIAN RIVER INLET BRIDGE

Replacement of Bridge 3-156,
SR1 over Indian River Inlet
State Contract # 26-073-03 Readvertised
Federal Contract # BRN-S050(14)

SCOPE OF SERVICES PACKAGE

CONTRACT DOCUMENTS

PART 3

**DESIGN REQUIREMENTS AND
PERFORMANCE SPECIFICATIONS**

TABLE OF CONTENTS

DESIGN REQUIREMENTS & PERFORMANCE SPECS

1.0 GENERAL..... 1

1.1 PURPOSE..... 1

2.0 DESIGN REQUIREMENTS 1

2.1 SCOPE..... 1

2.2 PROCEDURES 1

2.2.1 Format 1

2.2.2 Deviations 1

2.3 SUPPORTING ENGINEERING INFORMATION..... 2

2.3.1 Mapping and Surveying 2

2.3.2 Geotechnical..... 2

2.3.3 CADD 2

2.3.4 Traffic Data 2

2.4 DESIGN CODES AND MANUALS 2

2.5 PROJECT-SPECIFIC DESIGN PARAMETERS 3

2.6 ROADWAY GEOMETRICSS..... 3

2.6.1 Geometrics 3

2.7 DESIGN EXCEPTIONS AND DEVIATIONS 3

3.0 PERFORMANCE SPECIFICATIONS 3

3.1 STANDARDS AND REFERENCES 4

3.2 RELATION TO PART 6 – REQUEST FOR PROPOSALS PLANS 4

3.3 LIST OF PERFORMANCE SPECIFICATIONS 4

1.0 GENERAL

1.1 PURPOSE

This Part 3 – Design Requirements and Performance Specifications establishes basic design and performance requirements to be used in the design and construction of the Project. In addition, Directive and Indicative Plans for the Project and Contract Documents and Plans for the adjacent Indian River Inlet Projects (*see* Part 6 – Scope of Services Packages Plans) are provided to the Design-Builder for his information, review, and use in the his design and construction of the Project.

Section 2 provides direction on certain aspects of design applicable throughout the Project and the requirements to be followed for the design in the event a Project element or component is not covered by a Performance Specification.

Section 3 includes both the broad design and performance parameters, usually in the form of recognized standards, under which components and elements of the Project are to be designed and the specifically defined design and performance requirements relative to the Project. More detailed Performance Specifications are included in Appendix A to this Part 3 of the Contract Documents.

2.0 DESIGN REQUIREMENTS

The goal of the Project Design is to minimize design, construction, and maintenance costs while simultaneously minimizing the disruption and impacts to adjacent construction contracts, the Delaware Seashore State Park, marine navigation through the Indian River Inlet, local vehicular and pedestrian access, and communities.

2.1 SCOPE

The design requirements, as defined by standards, references, and project-specific requirements (*see* Section 2.5), are contained in each Performance Specification that governs the design of that Project element. Each Performance Specification lists the precedence of the design requirements.

All Project elements and components directly related to the bridge and all structures and appurtenances that touch, bear, or otherwise, through direct or indirect means, influence the structural response of the bridge or approaches shall be designed utilizing the “AASHTO LRFD Bridge Design Specifications”, Third Edition, 2004 (U.S. Customary Units), with Interims unless specifically modified in Section 2.4 of this Part 3 of the Contract Documents. The order of governing precedence of design codes, manuals, directives, and circulars are defined in Section 2.4 of this Part 3.

See Part 1 – Appendix A of the Contract Documents for more detailed information pertaining to the Project scope.

2.2 PROCEDURES

2.2.1 Format

The Design-Builder shall prepare Design Plans and Project Specifications for the Project to the Department’s standards for general content and format and in accordance with the Contract and Section 2.3.3.

2.2.2 Deviations

Deviations may be made within the framework of these design requirements to meet the requirements and

goals of this Section 2.0 and the Performance Specifications, in order to meet the requirements of a particular Project element or component. Deviations from the design requirements or Performance Specifications included in the Contract may be allowed with the approval of the Department's Project Manager prior to incorporation into the design. Determination as to whether the Design-Builder's solution to a Project element is unconventional shall be in the sole opinion of the Department. It is the responsibility of the Design-Builder to identify, explain, and justify any deviation from, discrepancy from, or unconventional solution to the established criteria and to secure approval(s) from the Department's Project Manager.

2.3 SUPPORTING ENGINEERING INFORMATION

2.3.1 Mapping and Surveying

Existing mapping and survey information is contained in the *Reference Documents* Section of the Scope of Services Package.

2.3.2 Geotechnical

Existing geotechnical data, including any supplemental data obtained by the Department during the Proposal phase, is contained within the *Reference Documents* Section of the Scope of Services Package. The Design-Builder shall conduct additional geotechnical investigations, analyses, design, and construction in accordance with the *Geotechnical Requirements* Performance Specification (*see* Appendix A to this Part 3 – Design Requirements and Performance Specifications).

2.3.3 CADD

CADD formatting for Design Plans and Record (as-built) Drawings shall conform to the Department's CADD drafting standards and CADD design standards as defined in the Plan Development Guidelines available from the Department's Project Development Resource Center. Resource Center information can be found at http://www.deldot.net/static/doing_biz.shtml.

2.3.4 Traffic Data

Existing and Design Traffic Data is contained in the *Roadway Geometrics* Performance Specification (*see* Appendix A to this Part 3 – Design Requirements and Performance Specifications).

2.4 DESIGN CODES AND MANUALS

In addition to the requirements listed in this Section 2.0 and the Performance Specifications, the Designer must comply with all other applicable and currently effective engineering codes and standards, including those of the various federal, state, and local jurisdictions.

If codes, standards, and/or manuals are specified herein for the design of an element of the Project, then the edition(s) in effect on the Proposal due date shall be applicable to the Project. Responsibility for design remains with the Design-Builder in accordance with the terms and conditions of the Contract. If a code, manual, or standard is subsequently modified, the Design-Builder shall notify the Department of such modification(s), providing potential cost and schedule impacts to the Project, and request the Department's decision regarding application of the modification(s). If the Department directs the Design-Builder to comply with the modifications and any change in the cost or time of performance results, such change shall be processed by a change order.

The governing precedence of Parts 1 through 8 of the Contract Documents is specified in DB Section

102-1. Specific codes and standards include, but are not limited to, the following listed in order of governing precedence for this Part 3 of the Contract Documents:

- A) Performance Specifications for the Project;
- B) “AASHTO LRFD Bridge Construction Specifications,” Second Edition, 2004 (U.S. Customary Units), with Interims;
- C) American Association of State Highway and Transportation Officials (AASHTO) “AASHTO LRFD Bridge Design Specifications,” Third Edition, 2004 (U.S. Customary Units), with Interims through 2006;
- D) Delaware Department of Transportation “Bridge Design Manual” with Revisions;
- E) Delaware Department of Transportation “Road Design Manual” with Revisions;
- F) AASHTO, “A Policy on Geometric Design of Highways and Streets (Green Book),” Fifth Edition, 2004;
- G) AASHTO, “Roadside Design Guide,” Third Edition, 2002;
- H) “Manual of Uniform Traffic Control Devices (MUTCD),” Third Edition, 2003.

2.5 PROJECT-SPECIFIC DESIGN PARAMETERS

Project-specific design parameters are included under their appropriate and respective Performance Specifications. Project-specific design parameters may include, but are not limited to, design parameters specific to the Project, such as, bridge loadings, bridge and structure scour, design life, design speed, forecasted traffic volumes, number of lanes and lane widths, stopping sight distance, horizontal curvature, superelevation, vertical curves, horizontal and vertical alignments, grades, roadside clear zone width, minimum main span bridge navigational clearances, and aesthetic requirements.

See Part 1 – Appendix A of the Contract Documents for additional design parameters.

2.6 ROADWAY GEOMETRICSS

2.6.1 Geometrics

Roadway geometrics shall be in accordance with the codes and standards of Section 2.4 of this Part 3 – Design Requirements and Performance Specifications and the *Roadway Geometrics* Performance Specifications in Appendix A to this Part 3.

2.7 DESIGN EXCEPTIONS AND DEVIATIONS

No design exceptions to the roadway geometric requirements specified in the Roadway Geometrics Performance Specification in Appendix A to this Part 3 shall be permitted. Any requests for deviations from the Contract requirements shall be submitted to the Department for review and approval in accordance with Part 2 – DB Section 111-13.

3.0 PERFORMANCE SPECIFICATIONS

The Performance Specifications included in this Part 3 – Design Requirements and Performance Specifications, establish requirements that the Design-Builder’s Work shall achieve. The Performance Specifications provide clear requirements for how the finished product is to perform while allowing the Design-Builder considerable flexibility in selecting the design, means, materials, components, and

construction methods used to achieve the specified performance.

3.1 STANDARDS AND REFERENCES

Standards and references are cited within the Performance Specifications. The following distinction between “standards” and “references” apply. Standards constitute a further elaboration of the requirement. References constitute advisory or informational material provided for the Design-Builder’s benefit. This advisory information need not be followed, but in some cases provide acceptable solutions already used by the Department. In some cases, specific parts of the reference are cited in Performance Specifications as requirements. In case of conflict between the standards and the references, the standards shall govern unless specifically approved in writing by the Department.

3.2 RELATION TO PART 6 – REQUEST FOR PROPOSALS PLANS

The Performance Specifications contained in Appendix A to this Part 3 – Design Requirements and Performance Specifications also govern the applicability of the Plans contained in Part 6 – Scope of Services Packages Plans. Individual Performance Specifications establish which Scope of Services Package Plans apply and the extent to which those Plans apply. Indicative Plans are for reference as described in Section 3.1. The presence or lack of presence of an Indicative or Directive plan relative to an element or component of the Project should not be interpreted as reducing the flexibility or range of choices provided to the Design-Builder under a Performance Specification. Part 6 – Scope of Services Package Plans further address the distinction between Directive and Indicative Plans and the applicability of Directive and Indicative Plans.

3.3 LIST OF PERFORMANCE SPECIFICATIONS

The following is a list of the Performance Specifications contained in Appendix A to this Part 3 – Design Requirements and Performance Specifications:

- A) Aesthetic Requirements;
- B) Bridge Design Requirements;
- C) Bridge Drainage System;
- D) Bridge Hydraulics and Scour Requirements;
- E) Bridge Security Program;
- F) Concrete for Structures;
- G) Engineering Requirements;
- H) Geotechnical Requirements;
- I) Inspection, Maintenance and Construction Requirements;
- J) Mass Concrete;
- K) Public Outreach Requirements;
- L) Roadway Geometrics;
- M) Temporary Works;
- N) University of Delaware Bridge Monitoring Program;
- O) Warranty Requirements; and
- P) Wind Engineering Requirements.