

PREFACE

The *LADOTD Bridge Design and Evaluation Manual (BDEM)* has the objective of obtaining uniformity and establishing standard policies and procedures in the preparation of engineering and construction plans for bridge and highway structures in Louisiana. The *BDEM* shall be followed for all LADOTD projects regardless of project delivery methods (Design-Bid-Built, Design-Built, or other methods). Any deviations from the *BDEM* require approval of the LADOTD Bridge Design Engineer Administrator. Detail justifications must be submitted along with the request. Approved deviations from *BDEM* shall be noted on the design criteria of the project and contract plans as appropriate.

BDEM Organization

The *BDEM* is divided into four parts:

Part I – Policies and Procedures

Part II – Design Specifications:

Volume 1 – Bridge Design

Volume 2 – Movable Bridge Design

Volume 3 – Structural Supports for Permanent Highway Signs and High Mast Lighting

Volume 4 – Highway Safety Hardware

Volume 5 – Bridge Evaluation/Rating

Part III – Design and Detail Aids

Part IV – Background Information

BDEM Part I documents policies and procedures for the Bridge Design Section.

BDEM Part II documents all design related provisions. For fixed bridges and appurtenant components, provisions of the latest *AASHTO LRFD Bridge Design Specifications* shall govern where applicable, except as specifically modified by the requirements of *BDEM* Part II – Volume 1. For movable bridges and appurtenant components, provisions of the latest *AASHTO LRFD Movable Highway Bridge Design Specifications* shall govern where applicable, except as specifically modified by the requirements of *BDEM* Part II - Volume 2. For structural supports for permanent signs and high mast lighting, provisions of the latest *LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* shall govern where applicable, except as specifically modified by the requirements of *BDEM* Part II – Volume 3. For highway safety hardware, provisions of the latest *AASHTO Roadside Design Guideline* shall be referenced as a resource document in *BDEM* Part II – Volume 4. For bridge evaluation and rating, provisions of the latest *AASHTO The Manual for Bridge Evaluation* shall govern, except as specifically modified by the requirements of *BDEM* Part II –Volume 5.

BDEM Part III documents all design and detail aids.

BDEM Part IV documents the background information for the development of design provisions in Part II.

BDEM Format

BDEM Part I – Policies and Procedures is organized into Chapters. All references to *BDEM* Part I carry the prefix "P" followed by a section number. For example, P1.1 refers to Section 1.1 in Chapter 1, P6.2.5 refer to Section 6.2.5 in Chapter 6, etc.

BDEM Part II - Design Specifications is divided into five volumes. Each volume (except Volume 4) corresponds to a separate AASHTO code, and the Chapters and Sections in each volume parallel the corresponding AASHTO code. Within each volume, all references to the corresponding AASHTO code sections, articles, equations, figures or tables carry the prefix “A” and all references to the corresponding AASHTO code commentary carry the prefix “AC”. When referencing publications other than the corresponding AASHTO code in each volume, the name of the publication and the section or article number will be specified. All references to *BDEM* Part II - Design Specifications, carry the prefix “D”, and all references to commentary of Part II carry the prefix “DC”. The volume number will be specified when referencing *BDEM* Part II provisions in different volumes. When a *BDEM* Part II article modifies and/or adds information to a corresponding AASHTO code article, the first sentence shall read, “The following shall supplement Ax.x.x”. When a Part II article replaces a corresponding AASHTO code article, the first sentence shall read, “The following shall replace Ax.x.x”. For tables and figures shown in Part II that are not in the AASHTO code, each table and figure will be given a unique name, but without a number. For easy reference, all tables and figures are listed in the Table of Contents for each chapter. Volume 4 – Highway Safety is organized into its own chapters that do not correspond to the AASHTO Roadside Design Guidelines which is only referenced as a resource document.

BDEM Part III – Design and Detail Aids is organized into Chapters. All references to *BDEM* Part III carry the prefix "DD" followed by a section number. For example, DD1.1 refers to Section 1.1 in Chapter 1, DD2.2 refers to Section 2.2 in Chapter 2, etc.

BDEM Part IV – Background Information is organized into Chapters. All references to *BDEM* Part IV carry the prefix "B" followed by a section number. For example, B1.1 refers to Section 1.1 in Chapter 1, B2.2 refers to Section 2.2 in Chapter 2, etc.

Bookmarks are created in the *BDEM* for easy access to each section.

Maintenance and Revision of *BDEM*

The *BDEM* posted on the Bridge Design website is the latest version which can be revised whenever a need for revision arises. Maintenance and revision of the *BDEM* is the responsibility of the LADOTD Bridge Design Section. If a user believes that modifications and/or additions to the *BDEM* would improve the current design practice, they shall follow the course of action described in *BDEM* Part I Section 2.1 (P2.1). For questions or comments related to the *BDEM*, or to report errors in the *BDEM*, users shall submit the online *BDEM* Comment Form, found on the Bridge Design Section website under the heading *Bridge Design and Evaluation Manual*.

All revisions are distributed through Bridge Design Technical Memoranda (BDTM) and documented in *BDEM* revision history. At the time of publication, the manual has the publication date of 11/17/2014 on the bottom left side of each page. The date on each page will be changed to a new revision date whenever the page is revised. The outdated pages to be replaced will be archived.

Whenever a new edition of the AASHTO Specifications referenced in *BDEM* Part II is published, a BDTM will be issued to advise users when to implement the new edition. This will typically be done within six months after the publication date.

The latest AASHTO Specifications to be implemented for each volume in Part II, as of now, are listed below:

- Volume 1 – Bridge Design:
AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014 with 2015 Interim Revisions

- Volume 2 – Movable Bridge Design:
AASHTO LRFD Movable Highway Bridge Design Specifications, 2nd Edition 2007, with 2008, 2010, 2011, 2012, 2014, and 2015 Interim Revisions
- Volume 3 – Structural Support for Permanent Highway Signs and High Mast Lighting:
LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 1st Edition 2015
- Volume 4 – Highway Safety Hardware:
AASHTO Roadside Design Guide, 4th Edition 2011 (as a resource document)
- Volume 5 – Bridge Evaluation/Rating:
AASHTO The Manual for Bridge Evaluation, 2nd Edition 2011, with 2011, 2013, 2014, 2015, and 2016 Interim Revisions

Implementation Policy of BDEM and Revisions

For consultant projects, all provisions in the *BDEM* published before the Notice to Proceed (NTP) date for the contract shall be implemented. The Bridge Task Manager shall review *BDEM* revisions made after the NTP date and make the determination whether or not to implement them. Revisions should be implemented when there will be no impact to project schedule or project scope. When *BDEM* revisions that will alter project scope and may delay project delivery are deemed necessary, the Bridge Task Manager shall submit the proposed scope changes along with justification for the changes to the Bridge Design Engineer Administrator for approval.

Similar to consultant projects, in-house projects shall implement all *BDEM* revisions whenever possible during the project development process. When *BDEM* revisions that will alter project scope and may delay project schedule are deemed necessary, the Bridge Task Manager shall submit the proposed scope changes along with justification for the changes to the Bridge Design Engineer Administrator for approval.

Archived Manuals

The *BDEM* shall supersede the following documents: *LADOTD Bridge Design English Manual* (4th English Edition, Version 1.4, May 23, 2005), *LADOTD Bridge Design Metric Manual*, and *LADOTD LRFD Bridge Design Manual*. These manuals will remain on the Bridge Design Section website under the heading of *Bridge Design and Evaluation Manual/Archived Manuals*. However, these manuals still contain relevant design guidance that has not yet been fully adopted into the *BDEM*, such as Table 6.1 (Maximum Factored Axial Compressive Load Allowed) in the *LRFD Bridge Design Manual*. Design guidance from these manuals can be applied when needed, as long as there is no conflict with guidance given in the *BDEM*. The Bridge Design Section is in the process of reviewing all information in these manuals and will eventually incorporate all valid information to the *BDEM*. At that time, these manuals will be fully replaced by the *BDEM*.

All pages in the *BDEM* that are revised will also be archived in the same location.

Yearly versions of the *BDEM* will be archived at the end of December of each year and saved in the same location. For example, *BDEM_2014* includes all revisions made prior to the end of December 2014, *BDEM_2015* includes all revisions made prior to the end of December 2015, etc.

Guidelines

The following guidelines are referenced in the *BDEM* and are posted on the Bridge Design Section website under heading of Guidelines.

- Federal Aid Off-System Highway Bridge Program Guidelines 2009-2011
- Guide to Constructing, Operating, and Maintaining Highway Lighting Systems

The content of these guidelines shall be considered as part of the *BDEM*.

Published BDTMs

All published BDTMs shall be considered as part of the *BDEM*.