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Project Development Division
Bridge Design Section
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John Bel Edwards, Governor
Shawn D. Wilson., Ph.D., Secretary

MEMORANDUM

TO: ALL CONSULTANTS
ALL BRIDGE DESIGNERS

FROM: PAUL FOSSIER, P.E.
BRIDGE DESIGN ENGINEER ADMINISTRATOR

SUBJECT: BRIDGE DESIGN TECHNICAL MEMORANDUM NO. 60 (BDTM.60)
BRIDGE DESIGN AND EVALUATION MANUAL (BDEM) REVISION NO. 3

DATE: March 31, 2016

The following pages in BDEM have been revised or added. The BDEM posted on Bridge Design Section Website has been updated to include these pages. The revised pages (with changes in red) are also attached for reference.

Page No.	Revision Description
Revision History-i	Updated the page to document revisions
I.Ch3-7	Added reference to The AASHTO Manual for Bridge Evaluation in Section 3.5.
I.Ch6-1	Changed the word “BDTM” to “policy” in Section 6.1.
I.Ch6-3	Changed the reference from “LADOTD Policies and Guidelines for Bridge Rating and Evaluation” to “LADOTD BDEM Part II Volume 5 - Bridge Evaluation/Rating” in Section 6.2.3.
All pages in Part II – Volume 5	New publication of Part II Volume 5 – Bridge Evaluation/Rating.

The information in “The Policies and Guidelines for Bridge Rating and Evaluation” dated March 3, 2009 has been updated and incorporated in BDEM Part II Volume 5 – Bridge Evaluation/Rating. The Policies and Guidelines document is now obsolete and has been relocated from “Guidelines” tab to “Archived Manuals/BDTMs” tab on bridge design website for future reference.

The information in BDTM.28 (As-Designed Bridge Rating) dated April 5, 2011 has been updated and incorporated in BDEM Part II – Volume 5 – Bridge Evaluation/Rating. BDTM.28 is now obsolete and has been removed from the active BDTM list. The BDTM index has been updated to reflect the change.

All obsolete BDTMs are posted on bridge design website under “Archived Manuals/BDTMs” tab for future reference.

Refer to BDTM.50 for implementation policy on revisions to BDEM.

This technical memorandum is posted on the LA DOTD Website under [Inside La DOTD > Divisions - Engineering > Bridge Design > Technical Memoranda – BDTMs.](#)

Please contact Ms. Zhengzheng “Jenny” Fu (225-379-1321, zhengzheng.fu@la.gov) if you have questions or comments.

PF/zzf

Attachment

Cc: Janice Williams (Chief Engineer)
Chad Winchester (Chief, Project Development Division)
Kirk Gallien (Assistant Secretary of Operations)
David Miller (Bridge Maintenance Administrator)
Michael Vosburg (Chief Construction Division Engineer)
Edward Wedge (Project Management Director)
Jeff Lambert (Pavement and Geotechnical Engineer Administrator)
Simone Ardoin (Road Design Engineer Administrator)
Art Aguirre (FHWA)
District Administrators, ADA Engineering, ADA Operations, and District Area Engineers

Inactive

3.4—STANDARDS PLANS AND SPECIAL DETAILS

Standard plans are plans signed by the LADOTD’s Chief Engineer and stamped by a LADOTD bridge engineer. Special details are plans stamped by a LADOTD bridge engineer.

All standard plans and special details (hereafter jointly referred to as Standards) shall be developed following the same QC/QA process as described in Section 3.3.2. Refer to BDEM Part I, P9.2 for the standards development process/checklist. The DOTD Bridge Standards Manager shall be responsible for the coordination of creating or updating standard plans and special details that are maintained by the Bridge Design Section. The EOR for each category of the standards is assigned by the Bridge Design Engineer Administrator.

3.5—SOFTWARE

A pre-approved list of software is posted on Bridge Design Section website under QC-QA. If any other software is required for unique applications for which pre-approved software cannot be used, a synopsis of the software shall be submitted to the Bridge Design Engineer Administrator for approval prior to use. The synopsis shall include the name of the software and the developer, a general description of the functions, a certification from the software developer stating that it is maintained in accordance with the latest *AASHTO LRFD Bridge Design Specifications* and *The Manual for Bridge Evaluation*, and an account of the requester’s experience and the experience of other organizations or agencies that use the software. Data/results from in-house software will not be accepted as part of the deliverable.

6.1—DEFINITION AND MINIMUM REQUIREMENTS

A Bridge Rehabilitation/Repair project shall be defined as any bridge project in which the scope of work is to address deficiencies in an existing structure and/or to add functional capacity to an existing structure, such as bridge widening.

For rehabilitation/repair projects, an in-depth investigation of the condition of the existing structure shall be performed in accordance with the “Guidelines for Existing Structure Evaluation” established in this policy to identify all deficiencies and determine the scope of possible rehabilitation/repair. Design criteria for a rehabilitation/repair project shall be developed on a project-by-project basis depending on the given scope of work. Bridge widening design shall additionally follow the “Guidelines for Bridge Widening Design” established in this policy.

For repair-only projects, whose clearly defined scope of work is to restore damaged elements to a serviceable condition, the requirements of this policy may be waived with the approval of the Bridge Design Engineer Administrator.

The minimum requirements of a Bridge Rehabilitation/Repair project are as follows:

1. All deficiencies in the existing structure shall be identified and documented.
2. The existing structure shall be rehabilitated to improve the overall condition of the bridge to extend its service life and/or improve its bridge load rating as appropriate.

The minimum requirements for Bridge Widening projects shall include the following:

1. All deficiencies in the existing structure shall be identified and documented.
2. The existing structure shall be rehabilitated to improve the overall condition of the bridge to extend its service life and/or improve its bridge load rating as appropriate.
3. The widened portion of the structure shall be designed in accordance with the latest *AASHTO LRFD Bridge Design Specifications* and LADOTD Bridge Design Manuals including Bridge Design Technical Memoranda.
4. Existing bridge components, such as exterior girders, bent caps, columns, piles etc., that are subject to new loadings from the widening sections shall be evaluated based on the current specifications to determine their adequacy. Bridge components with insufficient capacity shall be replaced or rehabilitated as appropriate.

6.2—GUIDELINES FOR EXISTING STRUCTURE EVALUATION

For all bridge rehabilitation/repair projects, including bridge widening projects, an in-depth evaluation of the existing structure(s) shall be included in the scope of work. The evaluation shall be conducted in accordance with the guidelines listed below prior to proceeding with the design of the project.

6.2.1—Review of All Existing Project Documents

Review all relevant project information including as-built plans, shop drawings, rehabilitation work previously done to the structure, inspection reports, bridge load rating reports, accident records, maintenance records, geotechnical and test pile information, hydraulic analysis, scour information, and any other information pertaining to the structure(s).

rehabilitations appear necessary, evaluate locations and feasibility of providing temporary supports for the superstructure.

- e. Evaluate the conditions of bearings and joints to determine if replacement or modifications are needed.
- f. Evaluate the condition of the approach slab, abutment wall and approach slab connection, and relief joints. Inspect for settlement, voids under the slab, and any other structural deficiencies.
- g. Note any issues with the existing hydraulics and consider any other issues that may be created by the widening.

6.2.3—Evaluation of the Load-Carrying Capacity of the Existing Structures

Provide LRFR current-condition bridge ratings for superstructures and pile bents (except piles/drilled shafts) in accordance with the latest edition of the AASHTO *Manual for Bridge Evaluation*, **LADOTD BDEM Part II Volume 5 - Bridge Evaluation/Rating**, and Bridge Design Technical Memoranda.

Substructure elements, such as piles/drilled shafts in pile bents, and caps, columns, footings and piles/drilled shafts in column bents, which do not have an LRFR rating policy in place, shall require a design analysis to determine the following:

- Live load capacity of the member based on existing configurations for each load effect (axial, shear and moment) which is defined as Capacity
$$\text{Capacity} = \text{Factored Member Resistance } (\Phi R_n) - \gamma_{DC} (\text{DC}) - \gamma_{DW} (\text{DW})$$
- Live load demand for each load effect from HL-93 using Live Load Factor of 1.35 which is defined as HL-93 Operating Demand
$$\text{HL-93 Operating Demand} = 1.35 (LL_{\text{HL-93}})$$
- Live load demand for each load effect from HL-93 using Live Load Factor of 1.75 which is defined as HL-93 Inventory Demand
$$\text{HL-93 Inventory Demand} = 1.75 (LL_{\text{HL-93}})$$
- Live load demand for each load effect from LADV-11 using Live Load Factor of 1.75 which is defined as LADV-11 Inventory Demand.
$$\text{LADV-11 Inventory Demand} = 1.75 (LL_{\text{LADV-11}})$$