



Office of Engineering
 Project Development Division
 Bridge Design Section
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Bobby Jindal, Governor
 Sherri H. LeBas, P.E., Secretary

MEMORANDUM

TO: ALL CONSULTANTS
 ALL BRIDGE DESIGNERS

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

SUBJECT: BRIDGE DESIGN TECHNICAL MEMORANDUM NO. 55 (BDTM.55)
 BRIDGE DESIGN AND EVALUATION MANUAL (BDEM) REVISION NO. 2

DATE: March 9, 2015

The following pages in BDEM have been revised and incorporated in the BDEM posted on Bridge Design Section Website. The revised pages are also attached for reference.

Page No.	Revision Description
Revision History-i	Updated the page to document revisions
II.V1-Ch2-7	Replaced the “Qualified Product List (QPL) list” with “Approved Material List” in the third paragraph of Section 2.5.2.1.1. The LADOTD QPL list has been replaced with the Approval Material List since Oct. 1, 2014.
II.V1-Ch3-15	Improved the shades to distinguish Site Classes better.
II.V1-Ch3-16	Corrected the shades for Seismic Zone 1a and 1b (these two zones were reversed) and improved the shades to distinguish Seismic Zones better.
II.V1-Ch5-6	Revised the first paragraph of Section 5.8.2.7.
II.V1-Ch5-8	Revised the fifth line in the Concrete Cover Table to add the cover requirement at bottom surface of slab span.
II.V1-Ch5-10	Added reference to Part III, Chapter 1 – LG Girder Preliminary Design Charts in Section C5.14.1.2.

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)
 Vacant (Assistant Secretary of Operations)
 Kirk Gallien (Deputy 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 (02, 03, 04, 05, 07, 08, 58, 61, 62)

policy and guidance on LADOTD environmental process. This manual is posted on the LADOTD website. LADOTD Environmental Section is responsible for preparing the environmental decision documents and determining the type of permit required for each project. Permit Coordinator in the Environmental Section is responsible for securing all environmental permits. A list of permits and approvals are included in the *Environmental Manual of Standard Practice*. The Bridge Designer should work closely with the Permit Coordinator while preparing permit applications.

2.5—DESIGN OBJECTIVES

2.5.1—Safety

The following shall supplement *A2.5.1*.

Refer to *BDEM, Part I, Chapter 3* for LADOTD Bridge Design Section Policy on QC/QA.

2.5.2—Serviceability

2.5.2.1—Durability

2.5.2.1.1—Materials

The following shall supplement *A2.5.2.1.1*.

Refer to *Standard Specifications* for material specifications.

Refer to *BDEM, Part I, Chapter 2—Bridge Design Committees* for new material approval process. Implementation of new materials or products must be approved by the Bridge Design Specification Committee.

Refer to *LADOTD Approved Material List (AML)* for approved materials.

Refer to *LADOTD Materials Sampling Manual* for the material sampling standards and acceptance requirements.

All above references are posted on LADOTD website.

2.5.2.1.2—Self-protecting Measures

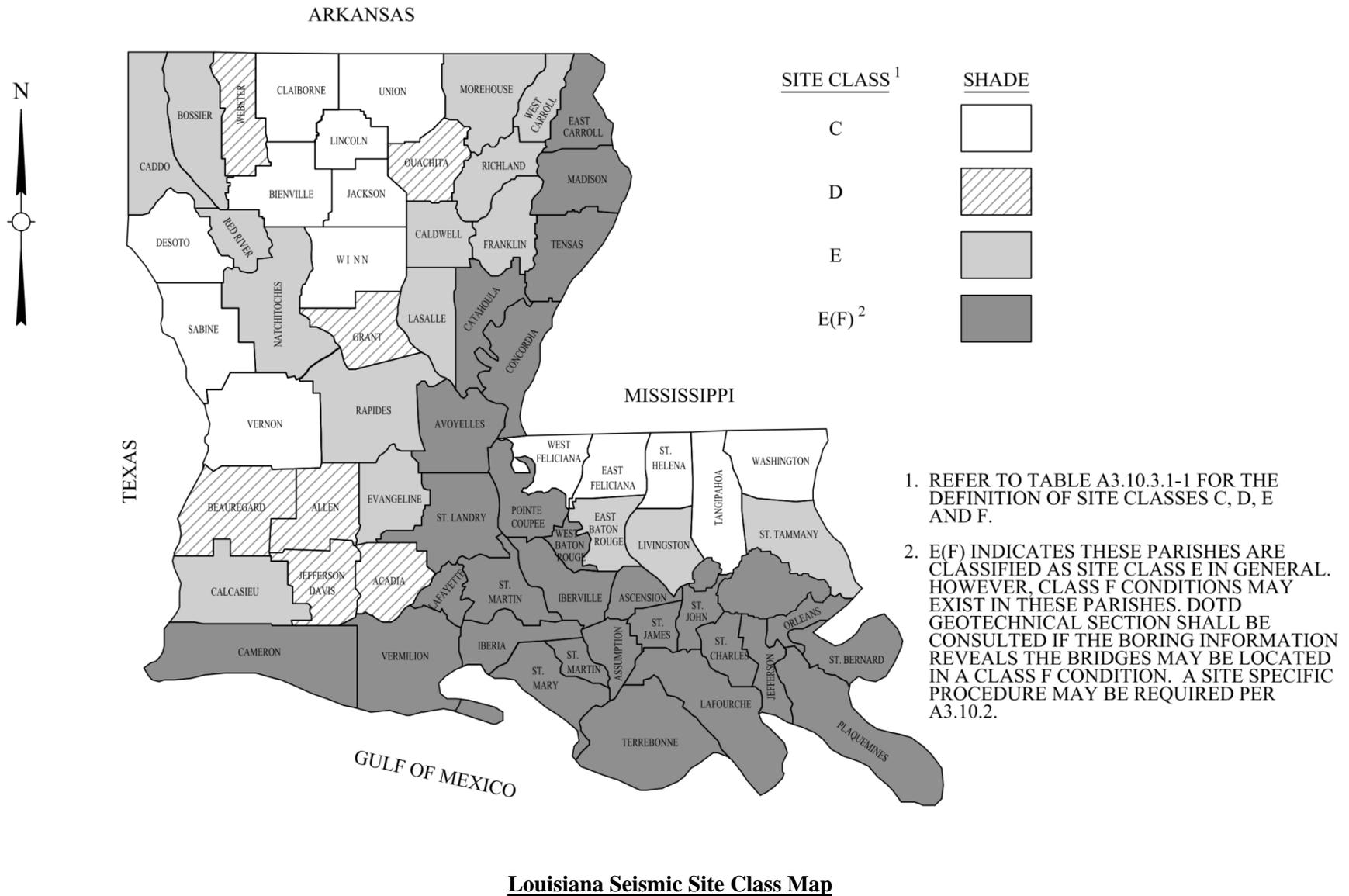
The following shall replace the first paragraph of *A2.5.2.1.2*.

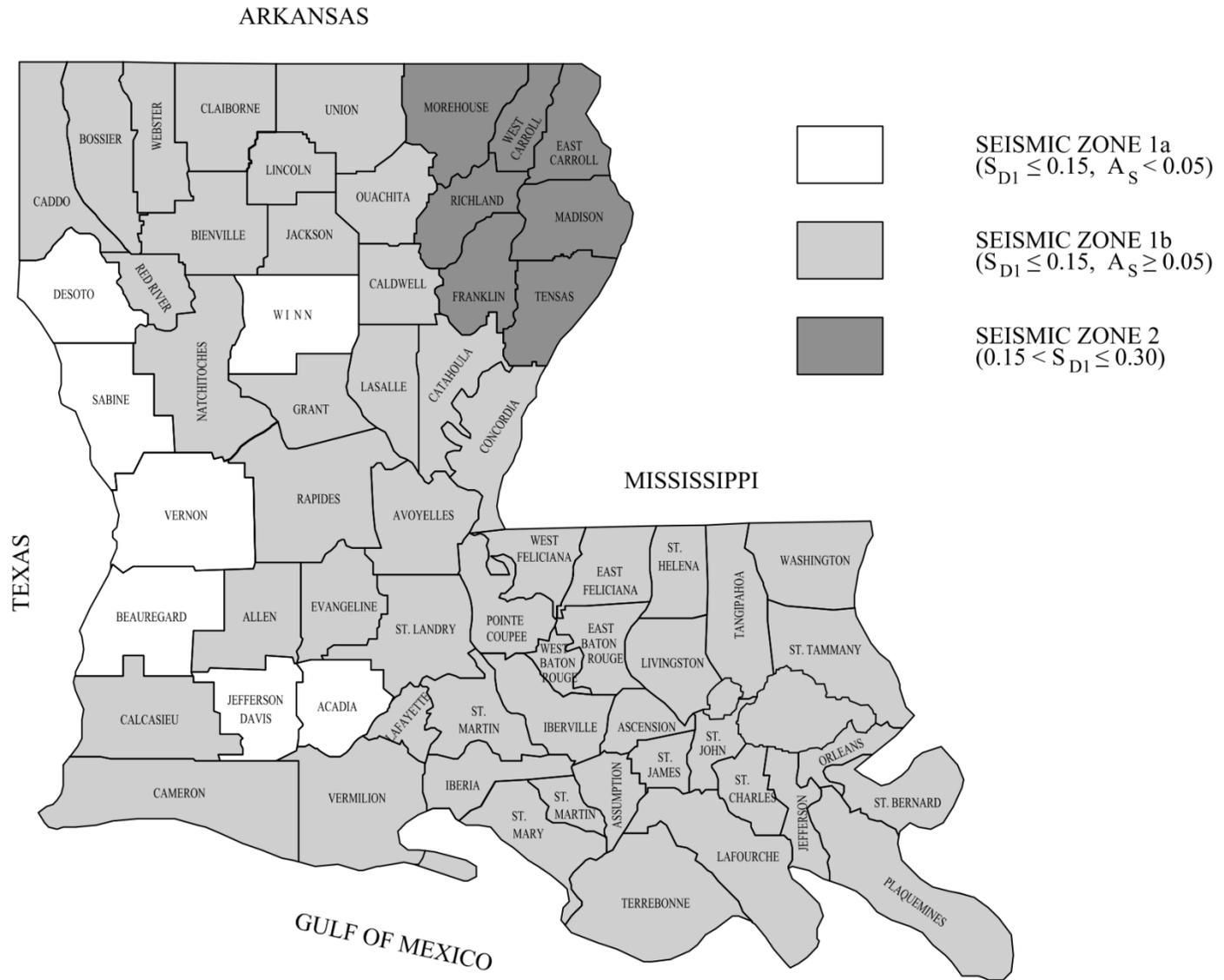
Continuous drip grooves or drip beads shall be provided along underside of a concrete deck at a

C2.5.2.1.2

The following shall replace the first paragraph of *AC2.5.2.1.2*.

Due to the limited use of salt in Louisiana, a minimum slope of 5 percent is considered a





Louisiana Seismic Zone Map

growth. Camber for each girder shall be measured prior to erection.

5.8— SHEAR AND TORSION

5.8.2— General Requirements

5.8.2.7—Maximum Spacing of Transverse Reinforcement

The following shall supplement A5.8.2.7.

For all concrete girders that span existing or future traffic lanes or railroad tracks, transverse reinforcement, including lower flange confinement reinforcement, is required throughout the full length of the girder and the spacing shall not exceed 12 inches.

Stirrups in all bent caps shall comply with the following spacing requirements:

- The first stirrup shall be placed no more than 3 inches from the face of a pile, drilled shaft, column, or the edge of the cap.
- The spacing between the first stirrup and an adjacent stirrup shall not exceed 6 inches.
- The spacing between all remaining stirrups shall not exceed 12 inches.

5.8.3.4—Procedures for Determining Shear Resistance

The following shall supplement A5.8.3.4.

A5.8.3.4.1 shall be used for reinforced concrete sections.

A5.8.3.4.2 shall be used for prestressed concrete sections and reinforced concrete sections that are not covered by A5.8.3.4.1.

The same method used for the design shall also be used for the as-designed bridge rating calculations.

C5.8.2.7

The following shall supplement AC5.8.2.7.

This design requirement is intended to contain damaged concrete, following vehicle or train collisions, and to prevent spalled concrete from falling on vehicles or trains. This will also provide minimum shear strength to better facilitate temporary shoring following collisions, which may better enable a damaged structure to carry traffic until such time as the structure can be repaired.

Design Engineer Administrator.

Combination of straight and draped strand pattern may be utilized in order to satisfy the allowable stresses at release. If debonding is deemed necessary and approved, then the criteria of A5.11.4.3 shall apply.

5.12–DURABILITY

5.12.1–General

The following shall supplement A5.12.1.

LADOTD's strategy to provide durability for concrete structures consists of a combination of methods: utilizing high performance concrete with permeability/surface resistivity requirements for all structural concrete elements, providing minimum concrete covers, controlling crack width by distribution of reinforcement, specifying water curing procedures in *Standard Specifications*, and providing protective measures and details as specified in A2.5.2.1 and D2.5.2.1.

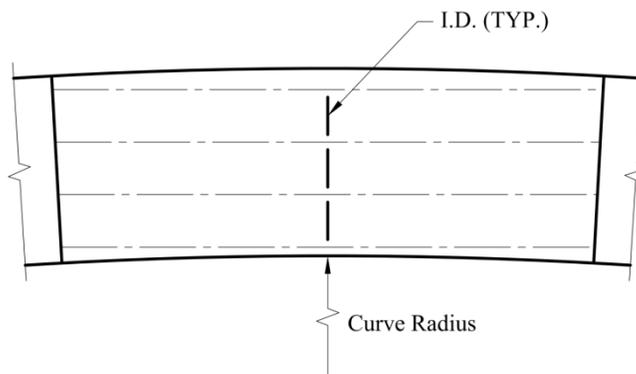
5.12.3– Concrete Cover

The following shall replace A5.12.3.

Concrete Cover for unprotected prestressing and reinforcing steel, which is defined as the distance from the edge of concrete to edge of the nearest reinforcement, shall not be less than that specified in the table below:

Concrete Cover Table

Application	Cover (inches)
All superstructure components unless otherwise specified	2
All substructure components unless otherwise specified	3
Deck / Slab Span / Approach Slab top surfaces for fixed bridges	2.5
Deck top surfaces for movable bridges	1.5
Deck/Slab Span bottom surfaces	1.5
Approach Slab bottom surfaces	2
Barrier Railing, Risers, and Diaphragms	1.5
Top flange and web of precast prestressed girders	1.5
All internal surfaces	1.5
Drilled Shafts greater than or equal to 30" in diameter	6
Drilled Shafts less than 30" in diameter	3
Surfaces cast against earth (excluding Approach Slabs)	4
Concrete Roadway Median Barrier	2



Spans on Curve

5.13.4—Concrete Piles

5.13.4.4—Precast Prestressed Piles

The following shall supplement A5.13.4.4.

Refer to LADOTD Bridge Design Special Details for precast prestressed concrete pile details.

5.14—PROVISIONS FOR STRUCTURE TYPES

5.14.1—Beams and Girders

5.14.1.2—Precast Beams

The following shall supplement A5.14.1.2.

AASHTO Type II, III, IV, BT-72, BT-78, and Quad Beam are the standard shapes of prestressed concrete girders. Louisiana Girder Shapes LG-25, LG-36, LG-45, LG-54, LG-63, LG-72, and LG-78 are allowed with the approval of the Bridge Design Engineer Administrator. AASHTO Type I and Type IV Modified girders are not allowed.

Value engineering proposals to change LG girders to other girder types are not allowed.

PPC girders maximum span lengths along with the associated maximum prestressing forces immediately prior to transfer are shown in the Girder Maximum Span Length Table.

Girder spacing within a bridge cross-section shall be equal where practical.

The girder types and strand patterns shall be minimized within a project to simplify fabrication. Girders with similar length and loads shall use the same girder type and strand pattern. Refer to D2.5.2.7.1 for requirements on exterior girder

C5.14.1.2

The following shall supplement AC5.14.1.2.

Refer to Part III, Chapter 1 "LG Girder Preliminary Design Charts" for design and detail aids on Louisiana Girders.