



DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

INTRADEPARTMENTAL CORRESPONDENCE

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MEMORANDUM

TO: Christopher Knotts, P.E.
CHIEF ENGINEER

FROM: Nick Fagerburg, P.E.
BRIDGE MAINTENANCE ADMINISTRATOR

DATE: July 19, 2022

SUBJECT: REVISION/DELETION/CREATION REQUESTED FOR EDSM IV.4.1.2

I am requesting approval for a revision to EDSM IV.4.1.2: LOUISIANA BRIDGE INSPECTION & LOAD RATING STANDARDS to incorporate the development of the LADOTD Bridge Inspection Manual and remove references to outdated Maintenance Directives.

Following are the updates:

- 1. Replaced references to Maintenance Directives with the LADOTD Bridge Inspection Manual
2. Added reference to each Metric associated with each policy/procedure
3. Revised/ Clarified Load Rating Engineer duties per Metric 4
4. Removed substitution of bridge design experience for inspection experience criteria
5. Revised items in the bridge file to more closely follow Metric 15 and AASHTO MBE, Section 2

Requested changes have also been verified by the sections affected by this EDSM. These Section Heads have signed below.

If you have any questions or concerns; please feel free to contact me accordingly.

SSD/ssd

Attachments: EDSM current version, EDSM with track-changes proposed, and EDSM with proposed changes incorporated

cc: David Miller – Chief Maintenance Engineer
Zhengzheng “Jenny” Fu – Bridge Design Administrator
David Smith – Project Development Division Chief
Todd Donmyer – Assistant Secretary of Operations

Handwritten signatures and dates for approval: David Miller (7/19/2022), Zhengzheng Fu (7/19/22), David Smith (7/21/22), Todd Donmyer (7/25/2022)

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

ENGINEERING DIRECTIVES AND STANDARDS

Volume	Chapter	Section	Directive Number	Effective Date
IV	4	1	2	7-25-2022

SUBJECT: LOUISIANA BRIDGE INSPECTION & LOAD RATING STANDARDS

1. PURPOSE:

To formally establish responsibility and standards for periodic safety inspection and load rating evaluation of all bridges on public roads in Louisiana.

2. SCOPE:

This directive covers the general policies of this Department regarding periodic safety inspection and load rating evaluation of bridges on public roads in Louisiana.

3. POLICY:

**3.1 National Bridge and Inspection Standards (NBIS)**

The *National Bridge and Inspection Standards (NBIS)*, as set forth in the *Code of Federal Regulations, Title 23 (Highways), Part 650 (Bridges, Structures and Hydraulics), Subpart C (National Bridge Inspection Standards)*, shall hereby apply to all structures **defined as highway bridges** that are located on all public roads fully or partially within the boundaries of the State of Louisiana.

**NBIS definition of "bridge":**

*"Bridge: A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between under-copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening."*

**3.2 The American Association of State Highway and Transportation Officials Manual for Bridge Evaluation (AASHTO MBE)**

The *AASHTO MBE* is referenced by the *NBIS* for details concerning bridge inspections, bridge load ratings, bridge files and bridge inventory. Accordingly, all provisions of the *AASHTO MBE* apply to all bridges in the State of Louisiana that are governed by the *NBIS*.

**3.3 Exceptions**

Exceptions to these applications are limited to bridges located on public roads that are the responsibility of a Federal agency or private entity.

4. TERMINOLOGY:

**4.1 NBIS and 23 CFR 650**

In this *EDSM*, the term *23 CFR 650* shall be the abbreviation for the *Code of Federal Regulations, Title 23 (Highways), Part 650 (Bridges, Structures and Hydraulics), Subpart C (National Bridge Inspection Standards)*.

Since the *National Bridge Inspection Standards (NBIS)* are contained within *23 CFR 650*, the terms *NBIS* and *23 CFR 650* are in effect synonymous. Terms such as *23 CFR 650.301* refer to a particular subsection within the *NBIS*.

#### **4.2 Definitions**

Definitions of terms used in this *EDSM* can be found in *23 CFR 650.305* of the *NBIS*.

### **5. IMPLEMENTATION:**

The details of implementation set forth in this *EDSM* are intended to reinforce and/or augment the requirements established by the *NBIS* and by the *AASHTO MBE*.

#### **5.1 Establishment of *LADOTD Bridge Inspection Program***

As required by *23 CFR § 650.307* of the *NBIS (Metric 1)* and under the authority of Louisiana Revised Statute 48:35, *LADOTD* shall have a bridge inspection organization which shall be responsible for implementing:

- Statewide bridge inspection policies and procedures.
- Quality assurance and quality control for bridge inspections.
- Preparation and maintenance of a bridge inventory.
- Bridge inspections and the reports from those inspections.
- Bridge load ratings and the reports of those load ratings.
- Any other requirements or mandates of the FHWA through the *NBIS*.

This *EDSM* hereby establishes the *LADOTD Bridge Inspection Program* as the organization charged with implementing the responsibilities listed above. The functions necessary to carry out any of these responsibilities may be delegated, but any work contracted or delegated outside of *LADOTD* shall be completed in accordance with this *EDSM*.

#### **5.2 Requirements for positions within the *LADOTD Bridge Inspection Program***

##### **5.2.1 Program Manager**

Qualifications for the *Program Manager* are specified in *23 CFR § 650.309* of the *NBIS (Metric 2)*. Per this *EDSM*, the *Program Manager* of the *LADOTD Bridge Inspection Program* shall be the *LADOTD Structures and Facilities Maintenance Engineer*.

Certain program manager duties may be delegated as necessary to effectively manage the *Louisiana Bridge Inspection Program*. Duties that have been delegated are as specified within the *LADOTD Bridge Inspection Manual*.

Delegation of any *Program Manager* duties shall require that the person to whom the duties are delegated meet the minimum qualifications of the *Program Manager* as defined in *23 CFR § 650.309* of the *NBIS*. In cases where delegation is to an entity, a designated person within that entity shall meet these same qualifications. This shall include the engineer approving Routine, In-Depth, Fracture Critical, or Underwater inspections conducted by a consultant or local agency.

##### **5.2.2 Load Rating Engineer**

The load rating function of the *LADOTD Bridge Inspection Program* shall be managed by the *Load Rating Engineer (LRE)*. Per the requirements of *23 CFR § 650.309* of the *NBIS (Metric 4)*, the *Load Rating Engineer* shall be a licensed civil or structural engineer in the *State of Louisiana*.

Per *NBIS Metric 4*, "Many of the duties of the LRE may be delegated to one or more individuals at lower levels or other agencies, but the overall responsibility for load ratings of all bridges in the State ultimately resides with the LRE. The words overall responsibility for load rating bridges does not mean that the individual must complete or review all load ratings directly, but rather that the individual has final responsibility."

Per this *EDSM*, the *Load Rating Engineer* of the *LADOTD Bridge Inspection Program* shall be the engineer who is in charge of the *Bridge Rating Unit* within the *LADOTD Bridge Design Section*. The *Load Rating Engineer* shall maintain a staff capable of determining safe load-carrying capacities of public bridges in accordance with the *AASHTO Manual*, *LA DOTD Bridge Rating Manual* and *LADOTD Bridge Inspection Manual*. The *load rating engineer* shall be responsible for:

- Establishing a load rating policy for all bridges on public roads
- Determining overload screening and evaluation procedure
- Establishing the safe load posting requirements
- Consistency for load ratings of all public bridges

### **5.2.3 Inspection Team Leaders**

Each inspection *team leader* shall meet the minimum qualifications specified in *23 CFR § 650.309 of the NBIS (Metric 3)* and the *LADOTD Bridge Inspection Manual*.

All requests for certification and/or substitution must be made in writing by the *Assistant District Administrator--Operations* of the involved *LADOTD* district. Supporting documentation should be included.

All consultant inspection team leaders must meet qualifications prior to being authorized to proceed or participate with the inspection. Supporting documentation shall be provided to the *LADOTD Bridge Inspection Program Manager*.

### **5.2.4 Underwater Bridge Inspection Divers**

All underwater bridge inspection divers performing underwater bridge inspection in the *State of Louisiana*; including those not directly employed by *LADOTD*:

- Must have completed an *FHWA*- approved comprehensive bridge inspection training course or an *FHWA*-approved *underwater* bridge inspection training course.
- Must meet all requirements for an underwater bridge inspection diver in accordance with *23 CFR 650.309 of the NBIS (Metric 5)*.

Supporting documentation shall be provided to the *LADOTD Bridge Inspection Program Manager*.

### **5.2.5 Bridge inspectors**

All bridge inspectors performing bridge inspections in the *State of Louisiana*; including those not directly employed by *LADOTD*, must successfully complete an *FHWA*-approved comprehensive bridge inspection training course based on the *FHWA's Bridge Inspection Reference Manual (BIRM)*. The training course must be completed within 4 years of the inspector's employment as a *bridge inspector*.

All consultant inspectors must have completed training prior to being authorized to proceed or participate with the inspection. Supporting documentation shall be provided to the *LADOTD Bridge Inspection Program Manager*.

Exceptions are limited to employees of local agencies who perform only the Special (interim) inspections in accordance with the *LADOTD Bridge Inspection Manual*. However, DOTD strongly encourages that they complete the training.

#### **5.2.6 Refresher Training**

All individuals engaged in duties of the Program Manager or Inspection Team Leader during Routine, Fracture Critical, Underwater, Initial, or In-Depth inspections shall be required to meet the minimum refresher training requirements stipulated in the *LADOTD Bridge Inspection Manual* in addition to the qualifications listed above.

### **5.3 Inspection frequencies**

Frequency requirements for each inspection type are established by the *NBIS* in *23 CFR§ 650.311 (Metrics 6-11)*, supplemented by this *EDSM*, and applied by this *EDSM* to all bridge inspections in the *State of Louisiana*. The frequency requirements are described below.

The frequencies for inspections shall be determined by such factors as environment, construction material, state of maintenance and known deficiencies. Criteria and frequencies for more-frequent inspections can be found in the *LADOTD Bridge Inspection Manual*.

#### **5.3.1 Initial inspections**

The original or first inspection of a newly constructed bridge has no other definable frequency. Initial inspections may be performed at either the Routine level or the In-depth level, however an In-depth level inspection is preferred.

#### **5.3.2 Routine inspections**

The "normal" or default frequency for Routine inspections is 24 months. However, more-frequent inspections may be necessary for some bridges and less-frequent inspections may be allowable on other bridges.

Inspection intervals greater than 24 months for Routine inspections require written *FHWA* approval.

#### **5.3.3 Underwater inspections**

Underwater inspections shall be required for all bridges over water with structural components that remain submerged in 4 feet of water or more, or are otherwise inaccessible by wading/probing, during the regularly scheduled Routine inspections.

The "normal" or default frequency for Underwater inspections is 60 months. However, more-frequent inspections may be necessary for some bridges and less-frequent inspections may be allowable on other bridges.

Inspection intervals greater than 60 months for underwater inspections require written *FHWA* approval.

#### **5.3.4 Fracture-critical member (FCM) inspections**

Bridges that have been identified as having fracture-critical members (FCM's) require an FCM (i.e. "Hands-On") Inspection of the FCM's at intervals not greater than 24 months. The regularly scheduled FCM inspection shall be completed as part of the Routine inspection.

#### **5.3.5 Special, Damage, and In-depth inspections**

These inspections shall be conducted in accordance with the *LADOTD Bridge Inspection Manual* and/or on an as-needed basis as determined by the *Assistant District Administrator (ADA) of Operations, District Bridge Engineer, Program Manager, Load Rating Engineer, and/or Bridge Inspection Engineer*.

### **5.4 Inspection procedures**

#### **5.4.1 AASHTO MBE**

Each bridge shall be inspected in accordance with the inspection procedures set forth in the *AASHTO MBE, NBIS 23 CFR§ 650.313 (Metrics 12-21)*, and the *LADOTD Bridge Inspection Manual*.

#### **5.4.2 Team leader**

Each Routine, In-depth, Underwater and FCM inspection shall include the presence of at least one *team leader* who meets the requirements set forth in this directive above.

Damage inspections and Special inspections do not require the presence of a team leader, but the presence of one is recommended.

#### **5.4.3 Bridge load rating**

Each bridge shall be load rated as to its safe load-carrying capacity in accordance with the *AASHTO MBE, NBIS 23 CFR§ 650.313 (Metric 13)*, and *LADOTD EDSMs I.1.1.8 and I.1.1.15*. Bridges shall be posted or restricted in accordance with *LADOTD EDSM I.1.1.8, NBIS 23 CFR§ 650.313 (Metric 14)*, and the *LADOTD Bridge Inspection Manual*.

#### **5.4.4 Evaluation for scour vulnerability**

All bridges over waterways shall be evaluated for existing scour and scour vulnerability. Those evaluations shall be in accordance with *Hydraulic Engineering Circular No. 18 (HEC-18)* and with the *LADOTD Policy for Predicting Scour Elevation for Bridges (11/2/2009)*.

The NBIS requires that for bridges identified as "*scour critical*", a plan of action shall be developed and implemented to monitor known and potential deficiencies and to address critical findings. (See *NBIS 23 CFR 650.313 (e) (3) (Metric 18)*)

#### **5.4.5 Complex bridges**

Bridges that require specialized inspection procedures and/or additional inspector training or experience shall be identified as complex bridges. Each complex bridge shall have its own specialized inspection procedures, and shall be inspected according to those procedures. (See *NBIS 23 CFR 650.313 (Metric 19)*)

#### **5.4.6 Critical findings**

A critical finding is defined as "*a structural or safety-related deficiency that requires immediate follow-up inspection or action*" (*23 CFR 650.305*).

The NBIS requires that: “a statewide procedure shall be established to ensure that critical findings are addressed in a timely manner. The FHWA shall periodically be notified of actions taken to resolve and/or monitor critical findings”. (See *NBIS 23 CFR 650.313 (h) (Metric 21)*)

The procedure for addressing critical findings more specifically defined in the *LADOTD Bridge Inspection Manual*.

#### **5.4.7 Temporary Bridges**

Bridges that have been replaced with temporary structures to provide service to the traveling public shall be regularly inspected as required. Documentation of conditions shall be in accordance with the *LADOTD Bridge Inspection Manual*.

Temporary bridges constructed as part of a bridge replacement project are the sole responsibility and liability of the contractor. The contractor’s engineer shall inspect and verify the safety and adequacy of the temporary detour bridge for as long as it remains in service during the contract period.

### **5.5 Bridge inspection records**

The findings and results of bridge inspections shall be recorded on *LA DOTD* standard forms. The bridge inspection records shall become part of the *bridge file*. See *Section 5.7* of this *EDSM*.

The data required to complete the forms, as well as guidance with the functions that must be performed in order to compile the data, can be found in the current editions of following manuals/documents:

- *AASHTO MBE*.
- *NBIS 23 CFR 650.313 (Metrics 12 – 23)*
- *FHWA Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation’s Bridges*, also known as the *FHWA SI&A Recording and Coding Guide*.
- *LA DOTD Coding Guide*.
- *LADOTD Bridge Inspection Manual*

### **5.6 Bridge inventory**

*LADOTD* shall prepare and maintain an inventory of all bridge structures subject to the *NBIS*.

#### **5.6.1 Collection and retention of data for bridge inventory**

Inventory data shall be collected on standard data forms and will be submitted annually to the *FHWA* as support for *LADOTD*’s infrastructure needs.

The bridge inventory data shall become part of the *bridge file*. See *Section 5.7* of this *EDSM*. Guidance for the collection and retention of bridge inventory data can be found in the following documents:

- *FHWA Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation’s Bridges (SI&A Recording and Coding Guide)*
- *NBIS 23 CFR 650.313 (Metrics 12 – 23)*
- *LA DOTD Coding Guide*
- *LADOTD Bridge Inspection Manual*
- *AASHTO MBE*

### **5.6.2 Time limits for data entry into bridge inventory**

The *NBIS 23 CFR 650.315 (Metric 23)* establishes time limits for entering SI&A data into a state's bridge inventory. Per this *EDSM*, the limits that shall apply to SI&A data on all bridges in the *State of Louisiana* that are governed by the *NBIS* are 45 days for data on state-owned bridges and 90 days for data on bridges owned by other entities.

- For data from all inspections the time limits shall be measured from the date of inspection.
- For data on new bridges and from modifications to existing bridges that alter previously recorded data, the time limits shall be measured from the date that physical completion of the work has progressed to a point that safe collection of the required data is possible.
- For data concerning changes in load restrictions or changes in closure status, the time limits shall be measured from the date that the decision is made to change the load rating or closure status.

This *EDSM* also stipulates that the date on which inventory/condition information is collected is the date on which load rating needs shall be evaluated or performed.

Inspections and load ratings performed by consultant contracts shall submit a completed and approved bridge inspection form and load rating summary sheet to the project manager within the time limits above.

### **5.7 Bridge files**

A *bridge file* for each bridge shall be prepared and maintained for all bridges subject to the *NBIS* in accordance with *Metric 15*. The files should contain information from over the life of the bridge as much as possible. Data and documents in the bridge file shall be consistent with the AASHTO MBE. Items typically include, but not be limited to, the following:

- Inspection reports, structural inventory & appraisals, and load ratings.
- Critical Findings and follow-up actions
- Scour and Waterway Information
- Correspondence and photographs that pertain to any of the above records.

A more detailed list of items that should be included in a *bridge file* can be found in the *AASHTO MBE, Section 2*.

### **5.8 Quality control/quality assurance (QC/QA)**

The *NBIS* requires that *quality control (QC)* and *quality assurance (QA)* procedures shall exist within a state's bridge inspection organization in order to maintain a high degree of accuracy and consistency in the inspections (*NBIS 23 CFR 650.313 (Metric 20)*).

The aforementioned section of the *NBIS* also directs that the QC/QA procedures shall include:

- Periodic review of inspection teams
- Periodic bridge inspector refresher training for program managers and team leaders
- Independent review of inspection reports and computations



This EDSM affirms that the LADOTD Bridge Inspection Program has complied with these requirements by the creation of a *QC/QA Program* within the *Bridge Inspection Program*. The *LADOTD Bridge Inspection Manual* sets forth the policies, guidelines and procedures of the *QC/QA Program*.

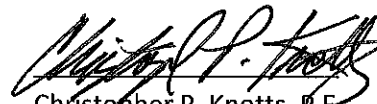
The *QA/QC Program* shall be managed by a *Civil Engineer* licensed in the *State of Louisiana*.

**6. RESPONSIBILITY:**

The *LA DOTD Structures and Facilities Maintenance Engineer* (acting as the official *Program Manager* for the *Louisiana Bridge Inspection Program*) shall be responsible for implementing this directive and shall issue specific directives as necessary to insure that Louisiana is in compliance with the *NBIS*.

**7. OTHER ISSUANCES AFFECTED:** All directives, memoranda, or instructions issued heretofore in conflict with this directive are hereby rescinded.

**8. EFFECTIVE DATE:** This policy will become effective upon signature of the Chief Engineer.



Christopher P. Knotts, P.E.

Chief Engineer