

**FISH AND WILDLIFE SERVICE
ENGINEERING AND CONSTRUCTION**

Engineering and Construction
Chapter 3 Vehicular Bridge Inspection

Part 362 Bridge Safety
362 FW 3

3.1 What is the purpose of this chapter? This chapter provides policy, guidelines, and procedures for implementing the Service's vehicular bridge inspection program.

3.2 What are the objectives of this policy? Our objectives are to:

A. Ensure the safety and integrity of Service-owned vehicular bridges, and

B. Identify the following bridge information that Regional managers use to set priorities and prepare budgets:

- (1) Safety deficiencies;
- (2) Maintenance, repair, and replacement needs and estimated costs; and
- (3) Safe load limits.

3.3 What are the authorities for this chapter?

A. Highway Bridge Replacement and Rehabilitation Program, Highway Safety Act (23 U.S.C. 144 and 151).

B. Federal Highway Administration Regulations; Standards for Bridges, Structures, and Hydraulics (23 CFR 650).

3.4 What is the scope of the Service's vehicular bridge inspection policy? This policy includes all Service-owned, vehicular bridges more than 10 feet long, regardless of who uses the bridges.

3.5 Who is responsible for the vehicular bridge inspection program?

A. The **Chief, Division of Engineering (DEN)** appoints a Service Bridge Inspection Program Manager.

B. The **Service Bridge Inspection Program Manager**:

(1) Administers the inspection program and develops guidelines, standards, and procedures for bridge inspection.

(2) Develops formats for initial data input, inspection data, and inspection reports.

(3) Hires consultants to perform the inspections.

(4) Prepares or oversees the preparation of bridge inspection reports.

(5) Maintains inspection records and the Service bridge inventory.

(6) Sends our inventory data to the Federal Highway Administration for inclusion in the National Bridge Inventory.

C. **Regional Engineers** appoint a Regional Bridge Coordinator in each Region.

D. **Regional Bridge Coordinators**:

(1) Provide data to the Service Bridge Inspection Program Manager to add bridges to or remove bridges from our inventory.

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(2) Assist the Service Bridge Inspection Program Manager with coordination of inspections within the Region.

(3) Review and provide comments and recommendations within the Region about findings and recommendations included in bridge inspection reports.

(4) Distribute bridge inspection reports, if necessary, to field stations and others within the Region.

E. Project Leaders:

(1) Determine public use status of bridges [see 23 CFR 650 and 23 U.S.C. 101(a)(27)].

(2) Determine functional level of bridges (see section 3.8).

(3) Provide operational information such as traffic volumes, speed limits, and types of vehicles using the bridge when this information is available.

(4) Review the findings and recommended work section of the bridge inspection reports.

(5) Complete station level maintenance and repair work, or initiate projects as appropriate for higher level maintenance, repair, or replacement needs.

(6) Inform the Regional Bridge Coordinator as soon as any bridge is:

(a) Out of service (no longer used),

(b) Removed, or

(c) Newly acquired or constructed.

3.6 What vehicular bridges does the Service inspect?

A. A vehicular bridge is a structure, including supports, erected over a depression or an obstruction, such as water, highway, or railway. The bridges we inspect have a track or passageway for carrying traffic or other moving loads and a minimum opening of more than 10 feet measured along the center of the roadway between undercopings of abutments, springlines of arches, or extreme ends of openings for multiple boxes (see Exhibit 1, Page 1).

(1) The undercoping of an abutment is the point where the bridge bearing seat intersects the front face (usually nearly vertical) of the abutment.

(2) The springline of an arch is the point or line at which the arch begins to curve.

B. We also inspect bridges that are made up of a series of pipes (culverts) when the distance between extreme ends as measured along the center of the roadway is more than 20 feet and the clear distance between openings is less than half of the smaller contiguous opening (see Exhibit 1, Page 2).

3.7 How does the Service classify bridges? We classify bridges based on their length, type of use, and/or condition (see Table 3-1):

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Table 3-1: Bridge Classifications	
A. Class A	<p>(1) Are more than 20 feet long and open to the public.</p> <p>(2) Are included in the National Bridge Inventory.</p>
B. Class B	<p>(1) Bridges more than 20 feet long that are not open to the public, and</p> <p>(2) Bridges between 10 and 20 feet long that may or may not be open to the public, and require the same inspection frequency (see section 3.11) as Class A bridges because of condition or hazard.</p>
C. Class C	<p>Bridges between 10 and 20 feet long where fewer inspections are justified on the basis of the following criteria:</p> <p>(1) Structural condition ratings are seven or higher (good condition with only minor problems) (see Exhibit 2 for structural condition ratings),</p> <p>(2) Scour condition ratings are seven or higher. (Any previous scour problems have been corrected. Bridge is not scour critical.) Scour is the removal of sediment from streambeds or stream banks caused by moving water. If water scours too much sediment supporting bridge piers and abutments, then the bridge could fail or become unsafe for travel,</p> <p>(3) The bridge does not have fracture critical members, and</p> <p>(4) The bridge's estimated remaining life is more than 10 years, i.e., the structure shows no appreciable signs of deterioration.</p>
D. Class D	Bridges that are out of service because of condition, road closure, etc.
E. Class E	Bridges on Service lands that a State, county, or other agency maintains and inspects.

3.8 How does the Service categorize the functional levels of bridges? A functional level is the category of service a bridge provides. The Project Leader determines the functional level of bridges based on their use and importance.

A. The functional levels applied to Service bridges are:

- (1) Level 1.** The bridge serves the main circulatory tour or thoroughfare for visitors or critical administrative/management functions.
- (2) Level 2.** The bridge provides access to areas of scenic beauty, picnic areas, etc., for visitors or serves secondary administrative/management functions.
- (3) Level 3.** The bridge provides convenience for visitors or Service personnel, but is not critical to the function of the Service. Reasonable alternate access exists.
- (4) Level 4.** The bridge provides only truck or four wheel drive access or serves lower priority administrative/management functions, or both. There is no public use of the bridge.

B. To determine these functional levels, the Project Leader considers such factors as:

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- (1) Speed and amount of traffic,
- (2) Type of vehicles using the bridge,
- (3) Users' familiarity with the bridge, and
- (4) Other factors listed in Exhibit 1, 362 FW 2.

3.9 How does the Service inspect its bridges?

A. The Service Bridge Inspection Program Manager typically hires consultants to inspect the bridges in the Regions but may inspect a bridge himself/herself. The Project Leader determines the functional level and classification of a bridge, and based on that information, the inspector evaluates the bridge using the design guidelines in 362 FW 2.

B. To make recommendations for maintenance, repair, and replacement, the inspector considers the adequacy of the structure for its functional level.

3.10 What are the different types of inspections and what types of reports result from them? Table 3-2 summarizes the types of inspections and their resulting reports. The Service Bridge Inspection Program Manager is responsible for the preparation of the inspection reports, maintains copies of all the reports, and provides copies to the Regions.

Table 3-2: Types of Inspections and Resulting Reports	
A. These Inspections...	B. Generate these Reports...
<p>(1) Inventory Inspection:</p> <p>(a) Is the first inspection of a bridge after we add it to the Service bridge inventory;</p> <p>(b) Includes gathering all location, structural, age and service, geometric, navigational, classification, and historical data on the bridge; and</p> <p>(c) Involves an evaluation of condition, a load rating and bridge posting analysis, and a safety appraisal of the bridge.</p>	<p>(1) Full Report:</p> <p>(a) A thorough, narrative report describing all features of the bridge including:</p> <ul style="list-style-type: none"> (i) Element condition assessments, (ii) Load ratings, (iii) Work recommendations, (iv) Cost estimates, and (v) Bridge Inventory and Appraisal data sheets that are required for the National Bridge Inventory. <p>(b) Contains a map showing the bridge location, a sketch of the bridge, photographs, and any other helpful items, such as examples of typical signs, and additional Service-related information for the bridge.</p>
<p>(2) Routine Inspection:</p> <p>(a) Determines any changes in the condition or use of a bridge, and</p> <p>(b) Typically takes place every other year.</p> <p>(c) The Service Bridge Inspection Program Manager decides whether to</p>	<p>Full Report, or</p> <p>(2) Check Report:</p> <p>(a) A short report that compares the condition of select elements of the bridge to their condition during the previous inspection.</p> <p>(b) Only prepared if the bridge was in satisfactory or better condition at the time of the previous inspection</p>

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Table 3-2: Types of Inspections and Resulting Reports	
A. These Inspections...	B. Generate these Reports...
prepare a check or a full report in coordination with the Regional Bridge Coordinator.	and no significant adverse changes in the condition of the bridge are discovered during inspection. (c) Does not contain maps, sketches, or photographs. (d) Never used for consecutive inspections.
<p>(3) Special Inspection:</p> <p>(a) Assesses damage caused by environmental or manmade disasters, or investigates deficiencies not visible by the methods typically employed as part of a routine inspection.</p> <p>(b) May be a planned inspection (or schedule of inspections) because of a concern about condition.</p>	<p>(3) Special Report. A short, narrative report. The format varies depending on the reason for the special inspection.</p>

3.11 How often does the Service inspect its bridges? The Inspection Program Manager, in coordination with the Regional Bridge Coordinator, determines the frequency of inspection for a bridge based on the type of structure, its use, and condition. Table 3-3 shows the bridges we inspect and the typical frequency of inspection.

Table 3-3: Frequency of Bridge Inspections	
These Classes of Bridges...	Are Inspected this Often...
A. Class A and B Bridges	Inspected at regular intervals not to exceed 24 months.
B. Class C Bridges	Inspected at regular intervals not to exceed 48 months. We may check these bridges and prepare a check report at the 24-month interval if the inspection team is at the station for inspection of other bridges.
C. Class D and E Bridges	Not inspected unless we have special reasons. For example, to identify repairs required to open a closed bridge or to determine the feasibility of repairing rather than replacing a closed bridge.

3.12 In addition to the chapters in this Part of the Service Manual, what other guidelines do our bridge inspectors use? The Service bridge inspection program complies with the National Bridge Inspection Standards. Inspectors use the following guidelines:

- A.** Federal Highway Administration Regulations; Standards for Bridges, Structures, and Hydraulics (National Bridge Inspection Standards), (23 CFR 650).
- B.** American Association of State and Highway Transportation Officials *Manual for Condition Evaluation of Bridges*.
- C.** Federal Highway Administration (FHWA) *Bridge Inspector's Reference Manual/02*.
- D.** FHWA *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges*.

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3.13 What does the Service do with the information it gets from the inspections?

A. The Division of Engineering maintains a Web-based bridge inventory database ([FWS Bridge Inventory](#)) on the Intranet that includes:

- (1) Bridge identification information,
- (2) Inspection data and summaries,
- (3) Work recommendations and cost estimates, and
- (4) Bridge inventory and appraisal data required for the National Bridge Inventory.

(a) The Service Bridge Inspection Program Manager and Regional Bridge Inspection Coordinators have access to the bridge inventory database.

(b) Others, such as Regional Engineers, Project Leaders, and Regional Facility Asset Managers are provided access upon request. Send requests for access to the Web-based bridge inventory database to the Division of Engineering, Attention: Bridge Inspection Program Manager.

B. The Service Bridge Inspection Program Manager, Regional Bridge Inspection Coordinators, Regional Program Managers, and Project Leaders work together to review the information to help them set priorities for bridge projects and establish schedules for continued inspections.

3.14 Do the people who inspect bridges for the Service need special qualifications? Yes, the Service Bridge Inspection Program Manager, the person who leads the inspection (usually a contractor's Bridge Inspection Team Leader), the person who calculates the safe load capacity, and divers must have the following qualifications:

A. The Service Bridge Inspection Program Manager must, at a minimum:

- (1) Be a registered professional engineer or have 10 years bridge inspection experience, and
- (2) Successfully complete an FHWA-approved comprehensive bridge inspection training course.

B. A Bridge Inspection Team Leader must at least have the qualifications in one of the sections in Table 3-4.

Table 3-4: Bridge Inspection Team Leader Qualifications
(1) Have: <ul style="list-style-type: none">(a) An associate's degree in engineering or engineering technology from a college or university that the Accreditation Board for Engineering and Technology accredited or determined is substantially equivalent,(b) 4 years of bridge inspection experience, and(c) Successfully completed an FHWA-approved comprehensive bridge inspection training course.
OR

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Table 3-4: Bridge Inspection Team Leader Qualifications

(2) Have:

(a) A Bachelor's degree in engineering from a college or university that the Accreditation Board for Engineering and Technology accredited or determined is substantially equivalent,

(b) Passed the National Council of Examiners for Engineering and Surveying Fundamentals of Engineering examination,

(c) 2 years of bridge inspection experience, and

(d) Successfully completed an FHWA-approved comprehensive bridge inspection training course.

OR

(3) Have:

(a) Received certification as a Level III or IV Bridge Safety Inspector under the National Society of Professional Engineers program, and

(b) Successfully completed an FHWA-approved bridge inspection training course.

OR

(4) Have:

(a) 5 years of bridge inspection experience, and

(b) Successfully completed an FHWA-approved bridge inspection training course.

OR

(5) Have the same qualifications as a Service Bridge Inspection Program Manager (section 3.14A).

C. Person Who Calculates the Safe Load Capacity. The person responsible for load rating bridges (usually a contractor) must be a registered professional engineer.

D. Divers. Divers who inspect the underwater components of bridges must complete an FHWA-approved comprehensive bridge inspection training course or other FHWA-approved underwater diver bridge inspection training course.


DEPUTY DIRECTOR

Date: December 20, 2007