

Errata Sheet

No. 1

Engineering and Design

USACE BRIDGE SAFETY PROGRAM

31 Jan 2020

Page 3, paragraph 7.b.(4), sentence 1, should read: "If there is a need for other structural evaluations, the district Bridge Safety Program Manager (BSPM) must determine the scope, and the evaluation will be conducted according to applicable FHWA, American Railway Engineering and Maintenance-of-Way Association (AREMA), or American Association of State Highway and Transportation Officials (AASHTO) guidelines."

Page 9, paragraph 9.c., sentence 1, should read: "The district BSPM must be a structural engineer, be a licensed professional engineer, have at least five years of experience in bridge inspections, evaluations, design, maintenance, and construction (inspection experience must predominate) and have successfully completed an FHWA-approved comprehensive bridge inspection training course."

Page 10, paragraph 9.e.(2), sentence 1, should read: "The district BSPM will designate the RBE."

Page 11, paragraph 9.e.(3), sentence 1, should read: "The district BSPM will designate railroad bridge inspectors."

Page 11, paragraph 9.e.(3), sentence 3, delete: "The inspector will be designated to authorize or restrict use of a bridge."

Page 11, paragraph 9.e.(3), sentence 5, should read: "'Inspectors should be familiar with the relevant aspects of 49 CFR 214, Railroad Workplace Safety,' Subparts A, B, and C."

Page 11, paragraph 9.e.(4), sentence 1, delete: "The BSPM will designate railroad bridge supervisors."

Page 16, paragraph 12.f., sentence 1 should read: "The standard 24-month inspection interval may be increased for bridges if past inspection reports as well as favorable experience and analysis justify the increase."

Page 18, paragraph 14.a.(1), sentence 1 should read: "All vehicular bridges (reportable bridges, short-span bridges, nonpublic access) must be posted for load-carrying capacity when required by references 4 and 22."

Page 26, paragraph 22.c., sentence 3 should read: "The HQ BSPM will provide overall coordination between the field offices and FHW A, provide "official" compliance data submissions or CEBIS access, and be responsible for coordinating and submitting any subsequent plans of corrective action."

Page 27, between reference number 1 and number 2, insert reference: "Code of Federal Regulations 49 CFR 214, Railroad Workplace Safety, 1 October 1996.
<https://www.govinfo.gov/app/details/CFR-1996-title49-vol4/CFR-1996-title49-vol4-part214>"

DEPARTMENT OF THE ARMY
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Washington, DC 20314-1000

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CECW-EC
CECW-CO

Regulation
No. 1110-2-111

31 January 2020

Engineering and Design
USACE BRIDGE SAFETY PROGRAM

1. Purpose. This regulation defines the policy for the management, periodic inspection, evaluation, program administration, and document management of bridges owned by the U.S. Army Corps of Engineers (62238862) on Civil Works projects.

2. Applicability. This regulation applies to all USACE Commands with Civil Works responsibilities.

3. Distribution Statement. Approved for public release; distribution is unlimited.

4. References. References are listed in Appendix A.

5. Records Management (Recordkeeping) Requirements. Records Management (Record Keeping) requirements. Records management requirements for all record numbers, associated forms, and reports required by this regulation are included in the Army's Records Retention Schedule – Army (RRS-A). Detailed information for all record numbers, forms, and reports associated with this regulation are located in the RRS-A at <https://www.arims.army.mil>.

6. Background.

a. The Surface Transportation Assistance Act of 1978 (Public Law 95-599) requires that all reportable bridges must be inventoried and inspected according to the National Bridge Inspection Standards (NBIS). Under these standards, each federal agency is required to record and maintain structure inventory and appraisal data on each bridge and report the data to FHWA upon request. The USACE Bridge Safety Program facilitates compliance with the NBIS for reportable bridges and ensures that appropriate evaluations are conducted and restrictions implemented to ensure public safety.

b. In addition to reportable bridges, USACE owns nonreportable bridges that are included on projects for vehicle or pedestrian access. These bridges are necessary for project operations or required by project authorization. Nonreportable bridges can have significant life safety risks or significant impacts on project function. The USACE Bridge Safety Program includes nonreportable bridges, as defined herein, to minimize risks to the public and project personnel and to support project function.

*This Engineer Regulation supersedes ER 1110-2-111, dated 01 August 2007.

7. Policy. All USACE offices having ownership or oversight responsibility of bridges as defined herein must inventory, inspect, evaluate, and prepare reports according to this Regulation, EM 1110-2-1102 (reference 4), and procedures contained in the Corps of Engineers Bridge Inventory System (CEBIS). Sufficient evaluations must be conducted to determine safety, structural integrity, capacity, and mission suitability. Restrictions will be implemented as required to comply with applicable laws and standards or when determined appropriate to ensure the safety of the public and USACE personnel. All documentation associated with USACE bridges must be retained in CEBIS, located at <https://cebis.usace.army.mil>, using the standard formats and files/folders provided.

a. Inspections.

(1) Inspect reportable bridges in compliance with the NBIS and this regulation.

(2) Inspect railway bridges based on references 2, 4, and 24.

(3) Inspect short-span, nonpublic access, public, nonpublic, and other pedestrian bridges according to this regulation.

(4) Identify and record all fracture critical members (FCM) on all bridges. Develop and execute an inspection plan for FCMs. See reference 4 for a definition of FCM and additional guidance.

(5) Identify all bridges that require an underwater (UW) inspection. Develop and execute an inspection plan for all bridges with UW features that require inspection. See reference 13 for definitions and additional guidance.

(6) Prepare and maintain inspection reports and inventory data in CEBIS for all bridges defined herein.

b. Evaluations.

(1) Scour Evaluations. Reportable bridges over waterways must be evaluated for the risk of failure from scour. All bridges that are not reportable bridges will be evaluated for the risk of failure from scour unless a written justification is submitted to and approved by the Major Subordinate Command (MSC). Conduct scour evaluations according to reference 4 and 9. See reference 4 for additional guidance and standard forms for recording scour data.

(2) Load Ratings. Load ratings, including fatigue evaluation, must be performed according to reference 4.

(3) Seismic Evaluations. Seismic performance data must be reported for each bridge. Seismically vulnerable bridges must be evaluated according to paragraph 16.

(4) If there is a need for other structural evaluations, the district BSPM must determine the scope, and the evaluation will be conducted according to applicable FHWA, American Railway Engineering and Maintenance-of-Way Association (AREMA), or American Association of State Highway and Transportation Officials (AASHTO) guidelines.

c. Administration.

(1) Program Management Plan (PgMP). Each district with a bridge inventory must prepare a PgMP that contains the information outlined in reference 4 and submit that PgMP annually by 31 October to their MSC for approval by 31 December.

(2) Budget. The district BSPM must determine program year funding needs annually and submit requests to the appropriate Operations, Program, or Business Line Manager in the format requested.

(3) Scheduling and Schedule Changes. All inspection schedules should be coordinated with Operations (or the applicable organization) prior to submission of the PgMP for approval. The Facilities and Equipment Maintenance system should be used to schedule inspections and recurring maintenance actions. If any proposed inspection date differs from the current designated interval by more than one month, a separate inspection schedule change request must be submitted in CEBIS no later than three months prior to the original inspection due date. Reportable bridge schedule changes greater than one month must be approved by the MSC BSPM, the HQ BSPM and the FHWA. All other bridges only need approval by the MSC BSPM.

(4) Reporting.

(a) The district's Chief of the Operations function will designate points of contact (POC) for each bridge to receive inspection reports, critical findings reports, evaluation reports, and reports of bridge maintenance and repair needs. The Operations POC will provide an annual report to the district BSPM of all bridge maintenance and repair activities. The Operations POC will also ensure that project personnel are aware of who the district BSPM is and that they should report any apparent bridge deficiencies discovered between formal inspections to the BSPM through appropriate chain of command.

(b) The district BSPM will provide inspection reports to the Operations POC and Chief of Engineering function upon completion, as well as any other reports that require action. Standard templates in CEBIS must be used when available but can be supplemented with attachments and photos. An annual maintenance and repair recommendation report, including relative risk scores and Bridge Safety Action Classification, will be prepared from CEBIS and submitted to the district's Chief of Operations or designated POC, with any other specific recommendations for prioritization of bridge needs. This information will be considered in determining budget requirements during the annual budget process.

(c) The USACE BSPM must send consolidated structure inventory and appraisal (SI&A) data of USACE public highway/roadway bridges to FHWA to comply with the NBIS.

(5) District Quality Control (DQC) Review and Agency Technical Review (ATR). All scour, fatigue, fracture, seismic, and other evaluations and load ratings must receive a DQC Review and ATR as defined by USACE Civil Works Review Policy. The DQC Review will be completed prior to the ATR.

(6) Bridge File Management. All documentation associated with USACE bridges must be maintained in CEBIS using the designated bridge files/folders. When critical documents (designated by an asterisk [*] next to the file or folder name in CEBIS) are missing or incomplete, a Plan of Corrective Action must be submitted to the MSC for approval and placed in the corresponding bridge file/folder.

(7) Qualifications and Training. The district BSPM will ensure that bridge inspections, evaluations, and associated reviews are performed by qualified individuals according to this regulation and reference 4. Training and experience for all personnel, including consultants, scheduled to perform inspections and evaluations will be included in the annual district PgMP and the bridge file.

8. Organizational Responsibilities. Headquarters, U.S. Army Corps of Engineers (HQUSACE), MSC, and district responsibilities must be coordinated among Engineering, Operations, Asset Management, and Programs/Project Management organizations at all levels. Some general responsibilities are described below. Detailed responsibilities, including coordination within and among organizations, must be clearly stated as part of the PgMP, Quality Management Plan (QMP), Quality Assurance Plan (QAP), Quality Control Plan (QCP), Safety Plan, and any other implementation document associated with bridge related work.

a. District.

(1) The Chief of the Engineering function is responsible for:

(a) Ensuring a safe bridge inventory, including implementation of applicable corrective/remedial action plans;

(b) Certifying that the inspections and evaluations were performed according to this regulation and the referenced criteria;

(c) Designating a district BSPM; and

(d) Resolving critical issues with the Chief of the Operations function.

(2) The district BSPM is responsible for:

(a) Ensuring that all aspects of the District Bridge Safety Program are implemented according to this regulation and reference 4. The BSPM must identify bridges that have FCMs, are scour critical, require UW inspection, and require structural evaluations (seismic, load rating, fatigue, and fracture).

(b) Other responsibilities include formulating the inspection plans, conducting the inspections, processing and analyzing the results of the inspections, evaluating the condition of the bridges, determining scope and frequency of future inspections, preparing and submitting the inspection reports, and managing the technical review process.

(c) Maintaining current, valid load ratings for all bridges in the inventory, coordinating the validation of load ratings with the USACE National Load Rating Engineer (LRE) and addressing issues the LRE raises in a timely manner, including NBI data, load rating assumptions, calculations or procedures, load rater or reviewer qualifications, completeness of documentation, recommended load posting, and implementation of posting. When the district or the LRE recommends posting, posting must be implemented within 60 days.

(d) Developing and maintaining a PgMP that includes a QMP, QCP, and QAP.

(e) Preparing, Maintaining, and Updating the District’s CEBIS Database. The BSPM is responsible for ensuring that all inspection reports and associated data are entered in the CEBIS database. These reports must be signed by the Team Leader and be ready for technical review within 60 days after the inspection is complete. The reports must be certified by the district’s Chief of Engineering and ready for QA review and approval by the MSC within 90 days after the inspection is complete. The district CEBIS data, including all inspection and inventory data, must be entered, reviewed, and approved as prescribed in Table 1. NBI data in CEBIS is considered “updated” after Technical Reviewer sign-off.

Table 1

Organizational responsibilities

Task	Time Frame	Signature Required
SI&A data updated in CEBIS and report prepared by Team Leader	Within 60 days of inspection	Team Leader
Technical Review performed by independent, qualified bridge inspector	Within 90 days of inspection	Technical Reviewer
Report certified by Chief, Engineering function	Within 90 days of inspection	Chief of district Engineering function (or delegate)
MSC QA and report approval	Within 120 days of inspection	MSC Commander (or delegate)

(f) Inviting a Representative from the Operations Function to Participate in Each Inspection. For the initial inventory inspection after completion of construction, a representative from the Construction function and Operations function must be invited to participate.

(g) Supporting Budget Development. Funding requests for bridge inspections, evaluations, repairs, improvements, or rehabilitation related to bridge safety must be coordinated and include budgetary cost estimates. These estimates should be generated and reviewed by the Engineering and Cost Estimating functions. The PgMP, budget, schedule, and justification must be provided to the Operations function and the Programs and Project Management function for use in the O&M budgeting process. Bridge maintenance, repair needs, and associated prioritization must be communicated using processes contained in CEBIS, reference 4, and current USACE budget development guidance.

(h) Coordinating with the Operations POC to ensure that appropriate physical barriers are in place for closed bridges and that closed bridges are inspected and properly coded in CEBIS. Controlled access must include restrictive signage, with a locked or secure gate or a physical barrier.

(i) Notifying any city, county, state, or local government and operating railway company that has jurisdiction of the roadway, pathway, or railway of the inspection.

(j) Providing Quality Check (QC) on all plans, inspections, evaluations and reports, and ensure that qualified personnel are used and technical reviews conducted as required. For reportable bridges, QC must check for compliance with metrics contained in reference 17. For any non-compliance identified by district, MSC, HQ or FHWA reviews, the district BSPM must create a Plan of Corrective Action (PCA) and actively implement.

(k) Tracking recommendations, maintenance, and repairs by using CEBIS and guidelines from reference 4.

(l) Supporting district, MSC, HQ, and FHWA QA activities and programmatic reviews by maintaining all documentation associated with the bridge inventory in CEBIS.

(m) Informing the Chief of the Engineering function of any program deficiency or issue that may affect the safety or operation of the inventory.

(3) The district Operations POC is responsible for the following:

(a) Identifying bridges present on each project not already in the bridge inventory;

(b) Coordinating with the Engineering function and the Programs and Project Management function to develop the annual O&M budget. Coordinate funding needs for bridge inspections, evaluations, repairs, improvements, or rehabilitation related to bridge safety;

(c) Providing programmed funding in a timely manner to enable the Engineering function to meet all deadlines; and

(d) Providing necessary assistance (idling machinery, ladders, opening gates, etc.) during inspections.

b. MSC.

(1) The MSC's Chief of the Engineering function must designate an MSC BSPM.

(2) The MSC BSPM is responsible for:

(a) Verifying that personnel are qualified to conduct technical QA reviews of district bridge inspections, evaluations, and other Bridge Safety Program-related products and that reviews are completed within established time frames;

(b) Conducting QA of district programs using standard checklists provided in CEBIS; conducting field reviews of selected bridge inspections; reviewing and monitoring the data collection, processing, evaluation, and inspection activity; monitoring the schedule of inspections and status of reports; verifying qualifications of the inspection and review teams; and for reportable bridges, ensuring any non-compliance with the metrics contained in reference 17 has a PCA and is actively being implemented;

(c) Ensuring timely approval of inspection reports, including satisfactory resolution of all review comments;

(d) Reviewing and approving district PgMPs by 31 December of each year;

(e) Coordinating with the MSC Operations function and the Programs and Project Management function on the annual O&M budget process for funding existing bridge inspections, evaluations, repairs, improvements, or rehabilitation related to bridge safety. This work includes verifying that bridges with a high relative risk score have been adequately considered in the submitted district budgets or are adjusted prior to submission to HQ;

(f) Submitting a summary report annually that includes the QA report from CEBIS to the BSPM HQ through the MSC Chief of the Engineering function; and

(g) Verifying that districts have performed final error checks on all data with the CEBIS error check routine and have corrected errors by 1 March of each calendar year.

c. HQUSACE.

(1) The Chief of the Engineering and Construction function is responsible for identifying the USACE BSPM.

(2) The USACE BSPM is responsible for:

(a) Establishing and monitoring compliance with policies and procedures associated with bridge inspection, QC, and QA;

(b) Preparation and maintenance of a bridge inventory and ensuring that bridge inspections, reports, load ratings, bridge evaluations, and other tasks are accomplished according to this regulation and the NBIS;

(c) Coordinating with the Chief of Operations Division (CECW-CO) on the annual O&M budget process for funding existing bridge inspections, evaluations, repairs, improvements, or rehabilitation related to bridge safety;

(d) Developing policy and procedures for implementing a Bridge Safety Program that covers public use bridges and other USACE bridges;

(e) Providing policy advice to HQUSACE elements on any new legislation related to the safety of USACE bridges;

(f) Providing policy compliance review of all decision documents related to bridge safety deficiencies;

(g) Acting as a proponent for training needs of USACE bridge inspectors and engineers and coordinating the training effort with courses that USACE and FHWA offer;

(h) Acting as liaison with state and other federal agencies;

(i) Providing QA review of MSC and district programs, including audits of representative samples of the bridge inventory and conducting site visits to individual bridges, as necessary;

(j) Submitting a summary report annually to the Chief of Engineering and Construction Division, Civil Works Directorate, (CECW-EC);

(k) Compiling SI&A data of USACE public highway/roadway bridges and submitting to FHWA by 15 March of each calendar year; and

(l) Implementing agency agreements between USACE and FHWA associated with the NBI, NBIS, and the Federal Lands Transportation Program (FLTP) and coordinating all USACE submittals associated with bridges.

9. Bridge Safety Program Team Qualifications and Requirements.

a. USACE Bridge Safety Program Manager. The USACE BSPM must be a structural engineer, be a licensed professional engineer, and have at least five years of experience in bridge

inspections, evaluations, design, maintenance, and construction and have successfully completed an FHWA-approved comprehensive bridge inspection training course.

b. MSC Bridge Safety Program Manager. The MSC BSPM must be a licensed professional engineer and have at least five years of experience in bridge inspections, evaluations, design, maintenance, or construction; or, must be a licensed professional engineer and have at least 10 years of experience in Civil Works inspections, evaluations, design, maintenance, or construction. Additionally, they must have successfully completed an FHWA-approved comprehensive bridge inspection training course.

c. District Bridge Safety Program Manager. The district BSPM must be a registered professional structural engineer; have five years of bridge inspection, evaluation, design, maintenance, or construction experience (inspection experience must predominate); and must have successfully completed an FHWA-approved comprehensive bridge inspection training course.

d. Field Inspection Team. All field inspections are to be performed by a team consisting of at least two people, with at least one person designated to lead the inspection who has the minimum qualifications shown in Table 2 and defined below. Where other than a Team Leader is designated in Table 2 to lead the inspection, that person must assume all duties and responsibilities of a Team Leader. Personnel who do not meet the qualification requirements of Team Leader or bridge inspector can assist with inspections under the direct supervision of a qualified Team Leader or bridge inspector. Other personnel may be involved as needed for safety or assistance during the inspection.

(1) Team Leader for Lower-Risk Bridges. A Team Leader for inspection of “lower-risk” bridges, as defined by FHWA (reference 17), must be a structural engineer by job title and type of work regularly conducted; have five years of bridge inspection, design, and construction experience (inspection experience must predominate); and have successfully completed an FHWA-approved comprehensive bridge inspection training course.

(2) Team Leader for Higher-Risk Bridges. A Team Leader for inspection of “higher-risk” bridges, as defined by FHWA (reference 17), must also be a registered professional civil or structural engineer. If a Team Leader will be inspecting bridges that have FCMs, he or she must have successfully completed a USACE-sponsored FCM inspection class. If a USACE-sponsored class is not available, a Team Leader may take an FHWA-approved FCM inspection class.

(3) Team Leader for Underwater Inspections. All UW inspections must be conducted under the direct supervision of a person who meets the minimum qualifications indicated in Table 2.

Table 2
 Inspection Team Leader qualification requirements

Bridge Type	Bridge Spans up to 20 Ft	Bridge Spans Greater Than 20 Ft
Reportable and short-span bridges	Team Leader	Team Leader
Nonpublic vehicle bridges	Team Leader (FCM) Inspector (non-FCM)	Team Leader
All public pedestrian bridges	Inspector	Team Leader
All nonpublic and other pedestrian bridges	*Determined by district BSPM	Inspector
Railroad bridges	Railroad bridge inspector	

Note: This individual can be designated Team Leader and must coordinate reporting requirements with the BSPM.

(4) Team Leader for Complex Bridges and Special Features. Team Leader must have a minimum of five years of experience in complex bridge design, inspection, and maintenance. For movable bridges. A Team Leader for movable bridges must also meet the qualification requirements outlined in the current version of reference 21. Inspection of movable bridges (swing, bascule, and vertical lift bridges) must also include a licensed professional mechanical engineer and licensed professional electrical engineer proficient with the methods and procedures described in reference 21.

(5) Inspector. An inspector must have at least an associate’s degree in civil engineering technology, and have successfully completed an FHWA-approved comprehensive bridge inspection training course.

(6) Underwater Bridge Inspection Diver (UBID). A UBID must have successfully complete an FHWA UBID training course or meet the qualifications indicated in Table 2. All UW inspections must be conducted under the direct supervision of a person who meets the minimum qualifications indicated in Table 2.

e. Railroad Bridge Inspection Team. 49 CFR 237 defines railroad personnel involved with bridge inspection as the follows:

(1) The BSPM, Team Leader, bridge inspector, and railroad bridge engineer (RBE) must meet the qualification requirements of 49 CFR 237 and this engineer regulation (ER) for the inspection and evaluation of railway bridges.

(2) Railroad Bridge Engineer. The BSPM will designate the RBE. The RBE must be competent to determine forces and stresses in components, prescribe safe loading conditions, prescribe inspection and maintenance procedures, and design repairs. The RBE must be a

professional engineer and must maintain an engineering degree accredited or recognized by ABET.

(3) Railroad Bridge Inspector. The BSPM will designate railroad bridge inspectors. Railroad bridge inspectors must be competent to inspect and record the condition of bridges and components. The inspector will be designated to authorize or restrict use of a bridge. Railroad bridge inspectors must have a minimum of five years of experience that is similar to that defined in 49 CFR 237.53 and must meet qualifications according to this ER. Inspectors must also be trained to understand the requirements of 49 CFR 214, “Railroad Workplace Safety,” Subparts A, B, and C.

(4) Railroad Bridge Supervisor. The BSPM will designate railroad bridge supervisors. Railroad bridge supervisors must be technically competent to supervise construction, modification, or repair of a railway bridge and will be designated to authorize or restrict use of supervised bridges. A railroad bridge supervisor is responsible for construction and repair as well as general operation of a bridge. The railroad bridge supervisor is not responsible for inspection or load rating except for necessary coordination and enforcement of any load limit requirements. The railroad bridge supervisor must have at least 10 years of supervisory experience similar to that identified in 49 CFR 237.55.

f. Responsible Engineer:

(1) Scour, fatigue, fracture, seismic, and other evaluations and load ratings must be conducted by or under the direct supervision of a qualified responsible engineer. The responsible engineer must meet the following qualifications:

- (a) Be a structural engineer by job title and type of work regularly conducted;
- (b) Be a licensed professional engineer;
- (c) Have five years of experience performing the type of evaluation being performed; and

(d) Have completed a USACE- or FHWA/National Highway Institute (NHI)-sponsored training (if available) relevant to evaluations being performed and have a working knowledge of the criteria and methodology used to perform the evaluation.

(2) The responsible structural, hydraulic, and geotechnical engineers involved with the bridge scour evaluation should have working knowledge of the methods described in references 4 and 9 and must have successfully completed an FHWA training course for stream stability and scour.

(3) The responsible engineer involved with vehicular and pedestrian bridge load ratings should have working knowledge of reference 22 and the rating methodology used in a given load rating and must have successfully completed a Load Rating of Highway Bridges course.

(4) The responsible engineer involved in a railroad bridge load rating must have at least 10 years of experience similar to that identified in 49 CFR 237.51(a) and demonstrate a working knowledge of the AREMA Manual.

g. ATR Reviewer. Evaluations and significant structural repair designs must receive an ATR performed by an individual or team meeting the same qualifications as required for those performing the evaluation or design.

h. USACE National Load Rating Engineer. Load ratings will be validated by the designated USACE National LRE. See paragraph 12.b.(4) for the USACE LRE's responsibilities.

i. Bridge Inspection Report Technical Review Requirement. A technical review is required for all bridge inspection reports. The level and effort of review must be commensurate with the level of complexity and relative importance of the bridge. The intent of the review is to ensure compliance with established procedures and that assumptions are justified, valid, verified, and consistent with law and existing USACE regulations.

j. Bridge Inspection Report Technical Reviewer Qualifications. A technical reviewer must be a Team Leader qualified to inspect the type of bridge being reviewed and not be directly involved with the inspection and report writing. Reviewers must be USACE engineers and should be from outside the district that performed the inspection. If a technical review is being done for complex or special feature bridges, the reviewer will meet the requirements for Team Leader for complex bridges and special features. The names and qualifications of the reviewers should be included in the districts' QCPs. See reference 4 for more guidance.

k. Refresher Training. All BSPMs, Team Leaders, and technical reviewers must successfully complete a periodic bridge inspection refresher training class to maintain their qualifications, at a maximum of five-year intervals. USACE personnel should attend USACE-sponsored periodic refresher training classes. If a USACE-sponsored refresher class is not available or cannot be attended, as determined by the appropriate supervisor, an FHWA-approved course can be substituted.

l. Documentation Requirements. All qualifications for district and MSC personnel must be documented in the district and MSC QMPs, including a description of experience meeting the requirements of the NBIS and this ER. Alternate qualifications can be submitted for review and approval by the MSC, as applicable. See reference 4 for additional guidance and the documentation format. When evaluating experience, consider the following:

(1) The relevance of the individual's actual experience;

(2) Exposure to the problems or deficiencies common in the types of bridges the individual will inspect or evaluate;

(3) Complexity of the structures being inspected or evaluated compared with the knowledge and skills of the individual gained through prior experience;

(4) The individual's understanding of the specific data-collection needs and requirements;

(5) Demonstrated ability to lead bridge safety inspections or evaluations; and

(6) The level of oversight and supervision the individual will require.

10. Standards of Performance.

a. District BSPMs, supervisors, and Chiefs of the Engineering function have the primary responsibility for ensuring that qualified individuals are performing assigned tasks in conformance with applicable codes, policies, and standards and within established time frames and schedules. When deficiencies occur, district BSPMs, supervisors, or Chiefs of the Engineering function will take corrective action to prevent a repeat occurrence and ensure public safety.

b. MSC BSPMs are responsible for performing QA on bridge products and processes within their area of responsibility. If MSC BSPMs identify an egregious deficiency or have identified deficiencies that are not being corrected after repeated notification, the MSC BSPM will notify the district BSPM, the appropriate district supervisor, and the USACE BSPM in writing, including a description of the deficiencies; the name of offending person; a description of deficiency notifications, including approximate dates provided to the district; and a recommendation for corrective action.

c. Deficiencies, especially if repeated, that should be considered cause for action include the following:

(1) If a BSPM, Task Leader, inspector, or UBID is deficient in performing an inspection that does not meet the intent of USACE regulations and federal law or produces inaccurate, inadequate, and incomplete inspection documents as assessed by the QC/QA process;

(2) If a BSPM, Task Leader, inspector, or UBID is found to be falsifying bridge inspection records, misrepresenting bridge inspection hours on site, or otherwise failing to meet general ethical standards;

(3) Failure to attend required refresher classes or bridge inspection-related training at required intervals;

(4) Failure to maintain registration as a professional engineer, as applicable;

(5) Continued lack of proper follow-up for critical findings, critical scour, or other items that could adversely affect the performance of the bridge or the safety of the public;

(6) Failure to correct findings from NBIS QA Agency Compliance Reviews, including failure to respond to repeated compliance review inquiries;

(7) Recurring miscoded critical items, such as structural elements;

(8) Lack of follow-up for correcting load posting deficiencies;

(9) Failure to submit inspection data into inventory in a timely manner;

(10) Failure to follow or comply with any USACE regulations, federal policy, rules, or laws;

(11) Failure to inspect bridges at the required frequency; and

(12) Dishonest or unethical behavior that occurred during execution of the USACE Bridge Safety Program.

d. The employee's supervisor has the responsibility to take appropriate corrective action in consultation with the MSC BSPM and USACE BSPM. Corrective actions may include:

(1) Putting any program team member on probation and setting the terms of that probation. Probation will include a written plan of corrective action or an individual performance improvement plan.

(2) Suspending any program team member for egregious violations of policy, safety or ethics, or for failure to comply with or successfully complete the terms of their probation. A letter of suspension will be sent through the MSC to the district Chief of the Engineering function. Suspended individuals will be considered unqualified to participate in any aspect of the Bridge Safety Program.

(3) Reinstating any program team member who has successfully completed the terms of his or her probation. For reinstatement following suspension, the MSC BSPM and USACE BSPM must be provided a notice of reinstatement in writing.

e. The USACE BSPM has the responsibility to elevate any unaddressed or inadequately addressed issues associated with standards of performance to the district Chief of the Engineering function.

11. Inspection Procedures. Inspection procedures will be specified or referenced in the PgMP. The district BSPM is responsible for ensuring compliance with 650.313 of the NBIS and reference 4.

12. Frequency of Inspections. Inspection during the service life of the bridge includes an initial inventory inspection after initial construction or significant repairs are complete; periodic, routine inspections; damage; in-depth, fracture-critical, special inspections; and UW inspections.

Descriptions of these types of inspections are included in reference 1. Also, see reference 4 for detailed descriptions.

a. Initial Inspections. Initial inspections must be performed when new bridges are added to the inventory or after significant structural repairs or modifications have been performed on existing bridges. An initial inspection must be completed prior to opening the bridge to traffic and the report completed within 90 days of construction completion.

b. Routine Inspections. The standard interval for routine inspections for all bridges is 24 months. An increase or decrease the inspection interval may be warranted based on bridge condition and other considerations, as described in paragraphs 11f and 11g and in reference 4. The standard inspection interval for railway bridges is one per year, not to exceed 540 days between successive inspections.

c. Fracture Critical Member Inspections. The standard interval for FCM inspections for all bridges is 24 months.

(1) For all bridges, a decrease in the inspection interval may be warranted, as described in paragraph 11g.

(2) For nonreportable bridges, it may be acceptable to increase the inspection interval based on bridge condition and other considerations, as described in paragraph 12.f.

d. Underwater Inspections.

(1) UW bridge members must be inspected to the extent necessary to determine their condition and structural integrity. The standard interval for UW inspections for all bridges is 60 months. An increase or decrease the inspection interval may be warranted based on bridge condition and other considerations, as described in paragraphs 11f and 11g. See reference 4 for guidelines on UW inspections. Bridges on dams may not require a separate UW inspection.

(2) The district Dam Safety Officer (DSO) will determine the type and frequency of UW inspections for bridges on dams. The DSO will provide the inspection report and notification that no additional inspection is required. For those cases where an UW inspection has not been completed and is determined not to be required, the DSO will provide a signed memorandum for the record, with appropriate justification. This documentation will be stored in the bridge file. See reference 3 for dam inspection requirements.

(3) UW inspection using unmanned methods may be acceptable if conducted in a way that ensures a sufficient level of certainty. Consideration for any unmanned UW inspections is only as a secondary alternative if the more preferable, qualified, manned method is not feasible. See reference 4 for guidelines on unmanned UW inspections. MSC approval is required for use of unmanned UW inspections on public vehicular bridges.

e. **Damage, In-Depth, and Special Inspections.** A damage inspection is an unscheduled inspection to assess structural damage resulting from environmental factors or human actions. A special inspection is used to monitor a known or suspected deficiency. An in-depth or special inspection is scheduled at the discretion of the district BSPM. See reference 4 for guidance on determining the need for these types of inspections.

f. **Maximum Inspection Intervals.** The standard 24-month inspection interval may be increased for bridges if passed inspection reports as well as favorable experience and analysis justify the increase. See Table 3 for maximum intervals and reference 4 for guidance. Process inspection interval change requests in CEBIS must follow the protocol outlined in Table 3. Include all documentation in the CEBIS bridge file.

Table 3
Maximum inspection intervals (months)

Inspection Type	Standard Inspection Interval	Maximum Inspection Interval	Protocol to Increase Interval
Routine			
Reportable bridges	24	48	Proposal to increase submitted to MSC→HQ→FHWA; interval may not be increased without written FHWA approval.
Nonreportable bridges	24	60	Proposal to increase or maintain increased interval submitted to MSC for approval as part of the annual PgMP submission
FCM			
Reportable bridges	24	24	N/A
Nonreportable bridges	24	60	Proposal to increase or maintain the increased interval submitted to MSC for approval as part of the annual PgMP submission
UW			
Reportable bridges	60	72	Proposal to increase submitted to MSC→HQ→FHWA; interval may not be increased without written FHWA approval
Nonreportable bridges	60	72	Proposal to increase or maintain increased interval submitted to MSC for approval as part of the annual PgMP submission

g. **Inspection with Reduced Intervals.** Inspection intervals less than those required above may be necessary for bridges in poor condition or those subject to unusual loadings. See reference 4 for guidelines on shorter inspection intervals.

13. Load Capacity Rating.

a. All bridges must be load rated by qualified personnel. All vehicular bridges (reportable bridges, short-span bridges, nonpublic access) must be rated for safe load-carrying capacity according to reference 22. Pedestrian bridges must be rated according to reference 20. Railroad bridges must be rated according to references 2 and 25.

b. Responsibilities.

(1) The district BSPM is responsible for:

(a) Identifying bridges that require load ratings;

(b) Ensuring that a load capacity rating is determined if one does not exist or if conditions have changed to affect load or capacity;

(c) Identifying existing load ratings that require validation by the National LRE;

(d) Ensuring that the SI&A data reflects the current load rating; and

(e) Maintaining current, valid load ratings for all bridges in the inventory.

(2) The load rater is responsible for:

(a) Acting as the responsible engineer for conducting the load rating of a bridge according to references 4 and 22;

(b) Coordinating with the National LRE to ensure that the load rating results are identified and appropriate actions taken for cases that require traffic restrictions;

(c) Coordinating with the National LRE to ensure that proper QC and QA are conducted;

(d) Conducting QC for load ratings conducted by another load rater; and

(e) Addressing issues raised by the LRE in a timely manner, including NBI data, load rating assumptions, calculations or procedures, load rater or reviewer qualifications, completeness of documentation, and recommended load posting.

(3) The bridge inspection Team Leader is responsible for identifying conditions that warrant a possible load rating and notifying the BSPM that an updated load rating may be required.

(4) The USACE Bridge Safety Program National LRE is responsible for:

(a) Working under the direction of the USACE BSPM to establish formal policies and procedures associated with load ratings and load posting and to perform program-wide validation

and oversight to promote the goal of full and consistent compliance with NBIS, FHWA, and this regulation;

(b) Reviewing existing load rating documentation and NBI data and developing a prioritized list of potential deficiencies; working with the associated district and MSC BSPMs as well as the USACE BSPM to resolve or correct the deficiencies;

(c) Providing final QA of bridge load ratings and associated NBI data; verifying that ratings were performed by qualified personnel, generally reflect the current condition of the bridge, and are complete according to established policies and guidelines; and ensuring that ratings and associated NBI data are correctly documented in inspection reports and the CEBIS; and

(d) Performing QA when ratings have been validated to monitor changes in bridge condition that may require an updated load rating; consulting with and advising districts when load rating updates are recommended or required because of condition or policy changes.

14. Load Limit Posting.

a. Requirements.

(1) All vehicular bridges (reportable bridges, short-span bridges, nonpublic access) must be posted for load-carrying capacity according to references 4 and 22. If the bridge condition requires reducing the posted limit to less than 3 tons (2.7 metric tons), the bridge must be closed to vehicular traffic. All bridge signage must comply with reference 16 and be installed at the bridge within 30 days of determination of load posting requirement.

(2) Pedestrian Bridges. All pedestrian bridges must be posted when the safe load capacity is below 60 psf (3.1 kPa) of uniform load. The posting must limit the number of pedestrians on the bridge at one time. Bridges with a safe load capacity below 40 psf (1.9 kPa) of uniform load must be closed. The district BSPM may impose higher posting and closing limits if use and consequences of failure warrant increased limits. All pedestrian bridges are to be evaluated for compliance with current AASHTO guidance for bridge railings. Develop a Plan of Action (POA) for bridges that do not meet current design loadings for pedestrian railings.

(3) Railway Bridges. See reference 2 for guidance on control of railway loads.

b. Responsibilities.

(1) The district BSPM is responsible for:

(a) Ensuring that posting loads and configurations are determined and based on LRE-validated load ratings;

(b) Ensuring that appropriate road signage is determined for the load posting; developing specifications for fabrication and installation of signage according to reference 16 or local standards;

(c) Ensuring that appropriate business line managers and operations managers are aware of posting needs; and

(d) Following up with Operations to verify that necessary posting has been implemented.

(2) The USACE LRE is responsible for:

(a) Verifying that required or recommended load postings are documented in inspection reports as being in place and consistent with load ratings; and

(b) Assisting BSPMs with tracking and resolving posting deficiencies.

(3) The district Operations POC is responsible for:

(a) Ensuring that appropriate load limit signage is installed at correct locations according to reference 16; and

(b) Maintaining load posting signs.

15. Scour Evaluation.

a. Requirements. All bridges over waterways must be evaluated for scour following guidelines in references 4 and 9. Develop a scour POA for bridges that are scour critical. For bridges on dams, a scour evaluation may already exist. The district DSO will determine the need for a new scour evaluation. The DSO will provide notification in writing that an adequate scour evaluation has been conducted and that no additional evaluation is required. This documentation will be stored in the bridge file.

b. Responsibilities.

(1) The district BSPM is responsible for:

(a) Ensuring that a scour evaluation is performed if one does not exist;

(b) Identifying bridges with unknown foundations and bridges over tidal waterways;

(c) Identifying bridges that are scour critical;

(d) Ensuring that a scour-critical POA is developed and implemented, if required;

(e) Ensuring that the SI&A Item 113 rating is properly coded; and

(f) Identifying qualified individuals to perform scour evaluations and ensuring that adequate QA and QC of the evaluation are conducted.

(2) The district Operations POC is responsible for ensuring implementation of the Operations function responsibilities according to the scour POA.

16. Seismic Evaluation.

a. Requirements.

(1) All USACE bridges are to be screened for seismic risk according to reference 11.

(2) All bridges classified as Seismic Performance Categories B, C, and D must be prioritized according to the preliminary screening process in reference 11. Screenings and evaluations are not required for bridges in Seismic Performance Category A.

(3) Bridges determined to be seismically vulnerable must be evaluated using the evaluation process in reference 11.

(4) Seismic retrofits must be developed according to references 19, 20, 18, and 11.

(5) A seismic vulnerability evaluation is to be conducted for all bridges undergoing major rehabilitation. All existing bridges undergoing major rehabilitation will meet the requirements outlined in the current version of the "AASHTO Guide Specifications for LRFD Seismic Bridge Design" manual (see reference 18).

b. Responsibilities.

(1) The district BSPM is responsible for:

(a) Ensuring that the importance classification and soil site classification of the bridge are identified and the remaining service life estimated;

(b) Coordinating the screening, investigation, and evaluation process;

(c) Ensuring that a plan and schedule for developing and implementing necessary retrofits is implemented; and

(d) Identifying a qualified responsible engineer to perform seismic evaluations and retrofits and ensuring that adequate QA and QC of the evaluation are conducted.

(2) The MSC BSPM is responsible for ensuring the districts have plans for conducting seismic evaluations and for performing QA on those evaluations when complete.

17. Fatigue and Fracture Evaluation of Steel Bridges.

a. Requirements.

(1) A fatigue evaluation must be conducted for all public use bridges with FCMs and all public use bridges with fatigue-sensitive details according to reference 22.

(2) When cracks are known to exist, a fracture analysis may be necessary. Fracture analysis should be conducted according to reference 23.

b. Responsibilities.

(1) The district BSPM is responsible for:

(a) Identifying bridges that require fatigue evaluation;

(b) Determining when a fracture evaluation is required;

(c) Identifying qualified individuals to perform evaluations and ensuring that adequate QA and QC of the evaluations are conducted; and

(d) Developing remedial action plans for identified deficiencies.

(2) The responsible engineer is responsible for:

(a) Conducting the fatigue or fracture evaluation;

(b) Communicating findings of evaluations to the district BSPM; and

(c) Conducting a QC for evaluations conducted by another responsible engineer.

(3) The bridge inspection Team Leader is responsible for identifying conditions that warrant a fatigue or fracture evaluation.

18. Rehabilitation of Existing Bridges.

a. Bridge rehabilitation is defined as actions or strategies that prevent, delay, or reduce deterioration and restore or improve the function of an existing bridge. This process may involve major work required to restore or improve the structural integrity of a bridge as well as work necessary to correct major safety defects. Vehicular and pedestrian bridges will satisfy the design

requirements outlined in reference 19, 20, and 18 and include considerations for any additional or future crane loads.

b. Bridge rehabilitation includes all work related to major repair, rehabilitation, or replacement of superstructure and substructure elements as well as:

- (1) All work to restore and strengthen primary superstructure members;
- (2) Deck replacement and strengthening;
- (3) Superstructure replacement or strengthening;
- (4) Substructure/culvert strengthening and replacement; and
- (5) Deck widening.

c. Activities involving routine maintenance and isolated repairs are not considered rehabilitation. Such activities include:

- (1) All work to restore and repair secondary superstructure members (that is, bracing);
- (2) Joint repair or replacement;
- (3) Painting and striping;
- (4) Deck and crack sealing;
- (5) Polymer or polymer-modified asphalt overlay;
- (6) Minor spill/pothole repair (this may include partial or full-depth repairs);
- (7) Repair of damaged guardrails and approach rails; and
- (8) Replacing or repairing signs and lights.

d. Requirements.

(1) A field condition survey will be conducted prior to repair, rehabilitation, or replacement to confirm the condition of a bridge (based on inspection reports) and assess repair methods. The field condition survey will identify, measure, and quantify areas that require repair, rehabilitation, and replacement.

(2) The capacity of bridge components is to be verified and documented in the bridge file prior to and after work.

(3) The NBI condition ratings, AASHTO element ratings, and current load ratings are to be considered when determining the existing capacity of a bridge to be rehabilitated.

(4) Substructure elements should be checked when there is reason to believe that their capacity may govern the load capacity of the entire bridge.

(5) Rehabilitated vehicular and pedestrian bridges will satisfy the design requirements outlined in references 19 and 22 and include considerations for any additional or future crane loads.

(6) An updated load rating is required for all rehabilitated bridges and bridges that require major repair work, as outlined in Section 13.

19. Critical Findings. Activities and procedures for critical findings will be according to reference 4.

a. Responsibilities.

(1) The inspection Team Leader has the authority to close a bridge at any time significant deficiencies or other changes exist to the extent that the safety of the bridge is compromised and is responsible for:

(a) Identifying and verifying critical findings during the inspection and tracking the status of critical findings in subsequent inspections; and

(b) Initiating the notification hierarchy when the critical finding is discovered during an inspection, as provided in the Critical Finding Plan.

(2) The district BSPM is responsible for

(a) Developing a Critical Finding Plan in consultation with the Operations POC and pertinent local agencies;

(b) Identifying the district team responsible for closure and notification, developing the district closure and notification procedures, developing a notification hierarchy list of contacts, coordinating the notification and action plans with all responsible individuals and agencies, determining when a closed bridge can be reopened, and tracking and reporting all critical findings in the district;

(c) Ensuring that each individual on the team is familiar with the plan; and

(d) Ensuring that proper follow-up on critical findings is carried out and documented.

(3) The MSC BSPM is responsible for:

(a) Reviewing district closure and notification procedures;

(b) Developing the MSC notification hierarchy list of contacts as well as tracking and reporting all critical findings to the MSC; and

(c) Upward-reporting of critical findings.

(4) The USACE BSPM is responsible for:

(a) Establishing policy for reporting and action on critical findings; and

(b) Reporting all critical findings and follow-up actions for reportable bridges to FHWA.

b. Follow up on critical findings. Address critical findings in a timely manner. If the schedule of the Remedial Action Plan is not met, the Chiefs of the district's Engineering and Operations functions must be notified and are responsible for taking corrective action.

20. Bridge Removal from Inventory.

a. Requirement. A bridge will be removed from the inventory when it is replaced, demolished, or transferred to another agency following procedures in CEBIS. These procedures also apply when the bridge type must be changed (that is, changed from public to nonpublic).

b. Responsibilities.

(1) The district BSPM is responsible for:

(a) Identifying bridges that must be removed from the inventory; and

(b) Providing justification to the MSC BSPM to remove a bridge from the inventory.

(2) The MSC BSPM is responsible for approval of justifications of removal of a bridge from inventory.

21. Quality Management.

a. Quality management includes QC and QA procedures applied to all aspects of the USACE Bridge Safety Program. Quality management will be implemented throughout all levels of the organization according to the current USACE review policy and reference 4.

b. Quality Assurance Audits. Independent, HQ-led audits will be performed on select districts or bridges each year, either independently or in conjunction with FHWA reviews.

22. Interagency Coordination.

a. USACE is authorized to receive funds from the FLTP, administered by FHWA. According to FLTP legislation, memorandums of agreement between USACE and FHWA, and associated FHWA policies, USACE provides plans, documents, and certifications associated with USACE bridges and Bridge Safety Program activities, as requested by authorized FHWA representatives.

b. As a bridge owner, USACE is obligated to comply with the NBIS where applicable. FHWA performs annual compliance reviews of USACE. These compliance reviews are based on the following metrics:

- (1) Metric #1: Bridge inspection organization
- (2) Metric #2: Qualifications of personnel—Program Manager
- (3) Metric #3: Qualifications of personnel—Team Leader
- (4) Metric #4: Qualifications of personnel—LRE
- (5) Metric #5: Qualifications of personnel—UBID
- (6) Metric #6: Inspection frequency—Routine—lower-risk bridges
- (7) Metric #7: Inspection frequency—Routine—higher-risk bridges
- (8) Metric #8: Inspection frequency—UW—lower-risk bridges
- (9) Metric #9: Inspection frequency—UW—higher-risk bridges
- (10) Metric #10: Inspection frequency—FCM
- (11) Metric #11: Inspection frequency—frequency criteria
- (12) Metric #12: Inspection procedures—quality inspections
- (13) Metric #13: Inspection procedures—load rating
- (14) Metric #14: Inspection procedures—post or restrict
- (15) Metric #15: Inspection procedures—bridge files
- (16) Metric #16: Inspection procedures—FCMs
- (17) Metric #17: Inspection procedures—UW
- (18) Metric #18: Inspection procedures—scour-critical bridges

- (19) Metric #19: Inspection procedures—complex bridges
- (20) Metric #20: Inspection procedures—QC/QA
- (21) Metric #21: Inspection procedures—critical findings
- (22) Metric #22: Inventory—prepare and maintain
- (23) Metric #23: Inventory—timely updating of data

c. Detailed descriptions of these metrics and definitions of “compliance” can be found in reference 17. District and MSC BSPMs will ensure that compliance data is available in CEBIS and accommodate FHWA field reviews when requested. The BSPM HQ will provide overall coordination between the field offices and FHWA, provide “official” compliance data submissions or CEBIS access, and be responsible for coordinating and submitting any subsequent plans of corrective action.

d. In those cases where ownership or maintenance responsibility of a bridge is divided between USACE and other agencies, information pertinent to the condition of project elements owned or maintained by others, as observed by the USACE inspection team, must be furnished to the other agency for information purposes only. Where split ownership or maintenance responsibility exists, the district BSPM must ensure that documentation describing the responsibilities is contained in the CEBIS bridge file and has been reviewed by the district’s Office of Counsel.

FOR THE COMMANDER:

1 Appendix
Appendix A References



KIRK E. GIBBS
COL, EN
Chief of Staff

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Glossary

Abbreviations and Terms

Bridge Span

A bridge span is an opening measured along the center of the roadway or walkway between under copings of abutments or spring lines of arches or at 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.

Complex Bridge

A complex bridge is a moveable, suspension, cable-stayed, or other bridge with unusual characteristics. Complex bridges can include cable stays, suspension hangers, tower bearings or saddles, deviation blocks, stiffening trusses or frames, trunnion assemblies, span locks, mechanical and electrical systems, member connections, and anchorages.

Nonpublic Access Bridges

A nonpublic access bridge is a controlled-access vehicle bridge with spans greater than or equal to 6 ft. used for operation and maintenance purposes only; it includes culverts with roadway cover above the top of the culvert less than 1.5 times the culvert's span. Controlled access must include restrictive signage and a locked or secure gate or physical barrier.

Nonpublic Pedestrian Bridge

A nonpublic pedestrian bridge is a bridge used for operation and maintenance purposes only, with spans greater than or equal to 6 ft. and a deck walking surface at least 4 ft. above the grade or channel bottom below. These bridges can be subjected to a maintenance vehicle or similar loading. If vehicular traffic is allowed to cross, nonpublic pedestrian bridges must have posting for any weight restrictions. Access must be controlled by a physical barrier per Section 5e.

Nonreportable Bridges

Any bridge type defined herein, excluding reportable bridges.

Other Pedestrian Bridge

“Other pedestrian bridge” is defined as a public, nonpublic, or other bridge-like structure, such as a boardwalk, dock, or catwalk. The district Bridge Safety Program Manager (BSPM) will determine whether a structure is classified as an “other pedestrian bridge” and whether it should be included in the inventory.

Public Pedestrian Bridge

A public pedestrian bridge is a bridge that is open to public pedestrian traffic, with spans greater than or equal to 6 ft. and having a deck walking surface at least 4 ft. above the grade or channel bottom below. Public pedestrian bridges can be designed to support an occasional light non-public maintenance vehicle. These bridges may also accommodate public recreational vehicles such as an All-Terrain Vehicles (ATV) or snow-mobiles. Categorizing a public pedestrian bridge needs to take into account deck width, vehicle access, approach configuration and obstacles (such as bollards). If any type of vehicular traffic is allowed to cross, public pedestrian bridges must be posted to indicate weight restrictions.

Railroad Bridge

A railroad bridge, as defined by 49 CFR 237.5 (reference 2), is any structure with a deck, regardless of length, that supports one or more railroad tracks or any other undergrad structure, with an individual span length of 10 ft. or more located at such a depth that it is affected by live loads.

Reportable Bridges

A reportable bridge as defined in 23 Code of Federal Regulations (CFR) 650.305 reference 1, is a public structure that includes supports erected over a depression or an obstruction, such as water, a highway, or a railway, and that has a track or passageway for carrying traffic or other moving loads and a span of more than 20 feet. Report these bridges annually to the Federal Highway Administration (FHWA) for inclusion in the National Bridge Inventory (NBI).

Short-Span Bridges

A short-span bridge is a bridge open to public vehicular traffic, with spans from 6 ft. to 20 ft., and includes culverts with roadway cover above the top of the culvert less than 1.5 times the culvert's span.

Special Features

Special features are specific members that require close attention and exhibit more complex behavior than typical members (for example, structural cables, pins and hangers, high-strength steel types with a history of brittle behavior, seismic bearings, dampeners).