

GLOSSARY OF BRIDGE AND TUNNEL MANAGEMENT TERMS

The purpose of this document is to provide a quick reference to definitions and acronyms established in Federal requirements, industry standards, or Department of Energy directives and related to the requirements of DOE O 437.1A, Bridge and Tunnel Management.

1. Active Real Property Assets. A building, structure, or real property trailer with a FIMS status code of Operating, Standby, or Outgranted. A land parcel with a FIMS status code of Active Land.
2. Anticipated Service Life (ASL). An estimate of the remaining life of a bridge based on current age, structural condition, specification used for design, and capacity to handle current and future traffic. The ASL may be taken as the expected life of a new bridge less the age of the bridge under consideration. Selection of the ASL is the responsibility of the Responsible Engineer in consultation with site management. See FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006.
3. Assurance Systems. Encompass all aspects of the processes and activities designed to identify deficiencies and opportunities for improvement, report deficiencies to the responsible managers, complete corrective actions, and share lessons learned effectively across all aspects of operation. [DOE O 226.1B, Implementation of Department of Energy Oversight Policy]
4. Average Daily Traffic (ADT). Identifies the average volume of traffic for the average one day (24-hour period) during a data reporting year at a specific location or specific segment of road. FHWA Traffic Monitoring Guide, December 2022.
5. Annual Average Daily Traffic (AADT). The total annual volume of traffic passing a point or segment of a highway in both directions divided by the number of days in a year. FHWA-HIF-22-017, Specifications for the National Bridge Inventory (SNBI), March 2022.
6. Annual Average Daily Truck Traffic (AADTT). The total annual volume of truck traffic passing a point or segment of a highway in both directions divided by the number of days in a year. FHWA-HIF-22-017, SNBI, March 2022.
7. Average Daily Truck Traffic (ADTT). The total annual volume of traffic passing a point or segment of a highway in both directions divided by the number of days in a year. FHWA-HIF-22-017, SNBI, March 2022.
8. Bridge. See Vehicle Bridge, Pedestrian Bridge or Railroad Bridge.
9. Bankfull Discharge. For perennial streams (streams that always carry water), when the stream spreads onto the floodplain. Bankfull discharge is a relatively frequent watershed runoff event, usually more frequent than the two-year return interval. [FHWA-HIF-16-018, HEC No. 17, Highways in the River Environment: Extreme Events, Risk and Resilience, June 2016]
10. Base Flow. The long-term average discharge of a stream when the watershed is not immediately responding to rainfall events. Base flow comes from sources other than surface runoff. [FHWA-HIF-16-018, HEC No. 17, Highways in the River Environment:

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Extreme Events, Risk and Resilience, June 2016]

Best Practice. A method, procedure, process, or rule used to maintain quality as an alternative to mandatory legislated standards and can be based on self-assessment or benchmarking. The method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things, e.g., complying with legal or ethical requirements.

11. Bridge Evaluation. An assessment of the performance of an existing bridge. AASHTO, Manual for Bridge Evaluation, 3rd Edition, 2018.
12. Bridge or Tunnel File. A full history of the structure, including all design, construction, maintenance, repair, rehabilitation, use, and damage records. The Bridge or Tunnel File contains inventory data, inspection, testing, and evaluation records, load rating and evaluation data and reports. AASHTO, Manual for Bridge Evaluation, 3rd Edition, 2018.
13. Bridge Importance. See Essential Bridge.
14. Bridge Inspection Experience. Active participation in bridge inspections completed in accordance with the NBIS, in either a field inspection, supervisory, or management role. A combination of bridge design, bridge maintenance, bridge construction and bridge inspection experience, with the predominant amount in bridge inspection, is acceptable. [Code of Federal Regulations 23 CFR 650.305, Subpart C]
15. Bridge Inspection Report. An inspection-specific summary including information pertinent to bridge inventory management. The report serves as a summary of the inspection, inspection findings, and recommendations; as a historical record for future reference; and, as a legal record that documents inspection activity.
16. Bridge or Tunnel Inspection. Determination of the physical and functional condition of a bridge, tunnel, or culvert by identifying, quantifying, and documenting existing defects. Performed by qualified technical personnel familiar with relevant methods and procedures, tools and equipment, safety requirements, and documentation practices.
17. Bridge or Tunnel Inspection Findings. Observations or measurements describing the overall condition of the bridge or tunnel and defects collected during an inspection.
18. Bridge and Tunnel Inspection Organization. Personnel assigned responsibility for implementing the Department of Energy bridge management requirements or who conduct inspections or evaluations.
19. Bridge or Tunnel Inspection Report Recommendations. Corrective actions intended to ensure the safety and integrity of the bridge, culvert, or tunnel; to maintain it in good condition; and, to extend its service life. Actions may include additional inspection or evaluation, maintenance and repair, modernization, or operational activities.
20. Complex Feature. Bridge component(s) or member(s) with advanced or unique structural members or operational characteristics, construction methods, and/or

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requiring specific inspection procedures. This includes mechanical and electrical elements of moveable spans and cable-related members of suspension and cable-stayed superstructures.

21. Condition Assessment. The process of periodic physical inspection, assessment, measurement and interpretation of the resultant data to indicate the condition of a specific asset so as to determine the need for some preventative or remedial action. It is a crucial part of asset management to determine its current condition, remaining useful life and estimated cost to correct any deficiencies. [DOE O 430.1C, Real Property Asset Management]
22. Contracting Officer. A person with authority to enter into, administer, and terminate contracts and make related determinations and findings; includes certain authorized representatives of the contracting officer acting within the limits of authority as delegated by the contracting officer. [DOE O 541.1, Appointment of Contracting Officers and Contracting Officer Representatives].
23. Contractor Requirements Document (CRD). A document that defines the specific requirements associated with the functions, services or products provided by a contractor that will apply to contracts that include the CRD. Contractors are bound by applicable laws and regulations and the terms and conditions of their contracts and CRDs that are incorporated into contracts through the use of the clause at 48 CFR 970.5204-2, laws, regulations and DOE directives. [DOE O 251.1, Department Directives Program]
24. Controlled Access Vehicle Bridge. A structure including supports erected over a depression or an obstruction, such as water, a highway, or a railway, having a passageway for carrying traffic or other moving loads, and a Structure Length of more than 20 feet (6.1 meters). A traveler must pass through a staffed entry point and present identification to traverse this structure. These structures are not included in the National Bridge Inventory.
25. Countermeasures. Materials or systems intended to prevent, delay or reduce the severity scour and stream instability.
26. Critical Findings. A structural or safety related deficiency that requires immediate action to ensure public safety. See 23 CFR 650.305. Levels of Critical Findings and corresponding response times follow:
 - a. Emergency: used to report the failure or imminent failure of a critical primary structural component. An Emergency Critical Finding means that a failure is likely within a short time period. A re-inspection or repair should be scheduled, and the structure may require a Prompt Interim Action (PIA), load posting, or closure. Immediate action required.
 - b. Urgent: used to report a potentially hazardous condition, which, if left unattended beyond the next anticipated inspection, would likely become dangerous to persons or property. Also used to report the actual or imminent failure of a non-critical structural component. Such failures may reduce the reserve capacity or redundancy of the structure but would not result in a structural collapse. A re-inspection or repair should be scheduled, and the

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structure may require load posting. Action required prior to next routine inspection.

27. **Rapid:** used to report a potentially hazardous condition that is non-structural in nature but if left unattended beyond the next anticipated inspection would likely become dangerous to persons or property. Such failures would not affect the structure's load carrying capacity. Schedule required actions.
28. **Critical Findings Protocols.** A site-specific plan minimally identifying:
- a. members of the Critical Findings team and alternates,
 - b. team member contact information and responsibilities,
 - c. procedures for notifying team members upon discovery of a Critical Finding,
 - d. procedures for notifying:
 - (1) local agencies,
 - (2) local law enforcement agencies, and the Public Affairs Officer where local roads and traffic are affected,
 - (3) Site/Program leadership and the DOE BTM,
 - e. procedures for implementing temporary measures and,
 - f. guidelines on timeliness of actions, reporting requirements, and documentation procedures.
29. **Culvert.** A transverse structure, pipe, or series of multiple pipes, box(es), or arch(es) constructed to convey water or utilities under a road or railway.
- a. Culvert assets under a road with a Structure Length equal to or greater than 20 linear feet meet the FHWA definition of a bridge. These assets are inventoried in FIMS with Usage Code 1768 or 1769.
 - b. Culvert assets under railway with a Structure Length equal to or greater than 10 feet and located at such a depth that it is affected by live loads meet the Federal Railroad Administration (FRA) definition of a bridge. These assets are inventoried in FIMS with Usage Code 1468 or 1469.
 - c. Culvert assets with a Structure Length less than FHWA or FRA bridge length and an Opening Area of more than 20 square feet are inventoried in FIMS with Usage Code 2629. The FIMS Users Guide provides addition guidance for selecting real property asset Usage Codes.
30. **Design Strength.** The capacity of the structure or structural member being designed or analyzed (i.e. the Nominal strength) multiplied by the appropriate resistance factor.
31. **DOE Bridge and Tunnel Manager (DOE BTM).** The individual assigned or delegated the

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- duties and responsibilities for bridge and tunnel inspection, reporting, and inventory. [Code of Federal Regulations 23 CFR 650.305, and 23 CFR 650.507]
32. DOE Elements. Headquarters elements or first-tier organizations as listed in the Correspondence Style Guide, Office of the Executive Secretariat. [DOE O 251.1, Department Directives Program, current version.]
33. Elevated Walkway. See Pedestrian Bridge.
34. Essential Bridge. A bridge that is needed to continue functioning immediately after an earthquake or that crosses a route that is expected to remain open immediately following an earthquake. Any bridge not classified as essential is classified as a standard bridge. [FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, Jan 2006] An essential bridge satisfies one or more of the conditions identified in the reference or is designated as “Mission Critical” in the Department of Energy Facilities Information Management System.
35. Exempt Bridge. A bridge may be exempt from retrofitting if it is located in the lowest seismic zone or has limited remaining useful life. Temporary bridges and those closed to traffic are also exempt. [FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006]
36. Facility/Facilities. The land, buildings, trailers, their installed equipment, and other fixed systems and equipment installed therein, other structures and facilities, and other improvements. [DOE O 430.1C, Real Property Asset Management]
37. Flood. An event exceeding base flow where flows in a stream inundate normally dry land. [FHWA-HIF-16-018, HEC No. 17, Highways in the River Environment: Extreme Events, Risk and Resilience, June 2016]
38. Follow-up to Critical Findings Report. Documents Critical Finding discovery and resolution.
- a. Initial Report. The initial report includes the date and time of the Critical Finding discovery and notification, circumstances of the finding, severity and extent of finding, completed notifications, and closures or other limits imposed on the use of the bridge. The report includes supporting photos, sketches, and measurements.
 - b. Report of Recovery Strategy. This report updates the Initial Report and describes any temporary repairs and their inspection, other interim actions, and the intended recovery strategy with planned actions and milestone dates.
39. Fracture Critical Member (FCM). Steel tension members or steel tension components of members whose failure would be expected to result in a partial or full collapse of the bridge. [AASHTO, Manual for Bridge Evaluation, 2nd Edition] Fracture Critical Members require more thorough and detailed inspections.
40. Graded Approach. The process of ensuring that the levels of analyses, documentation, and actions used to comply with requirements are commensurate with: the relative

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importance to safety, safeguards, and security; the magnitude of any hazard involved; the life-cycle stage of a facility or item; the programmatic mission of a facility; the particular characteristics of a facility or item; the relative importance to radiological and non-radiological hazards; and, any other relevant factors. See 10 CFR Part 830.3.

41. Industry Standard. A set of criteria within an industry relating to the standard functioning and carrying out of operations in their respective fields of production. In other words, it is the generally accepted requirements followed by the members of an industry. It provides an orderly and systematic formulation, adoption, or application of standards used in a particular industry or sector of the economy. Industry standards vary from one industry to another. Industry standards facilitate global as well as domestic competitiveness. It is a crucial tool for developing and meeting industry goals. For example, in the automotive industry, tire sizes and durability must fall within a standardized range. Standardization serves as a quality check for any industry. [DOE O 430.1C, Real Property Asset Management]
42. Inspection – Damage. Unscheduled inspection to access structural damage resulting from environmental factors or human actions. See 23 CFR 650.305. Analogous to a Special or Emergency Inspection for railroad bridges. AREMA Manual for Railway Engineering.
43. Inspection – Nonredundant Steel Tension Member (NSTM). A type of In-Depth Inspection conducted at regularly scheduled intervals specifically to inspect NSTM(s) or member components. It requires close-up access, hands-on inspection, and may require non-destructive testing by qualified personnel to determine location and extent of cracking or other defects. See CFR 650.305.
44. Inspection – Fracture Critical Member. A type of In-Depth Inspection conducted at regularly scheduled intervals specifically to inspect Fracture Critical Member(s) or member components. It requires close-up access, hands-on inspection, and may require non-destructive testing (NDT) by qualified personnel to determine location and extent of cracking or other defects.
45. Inspection – In-Depth. A hands-on, close-up inspection of one or more structure elements above or below the water level to identify any deficiencies not readily detectible using Routine Inspection procedures. An In-Depth Inspection is also used to identify developing problems that impact present service requirements or to obtain detailed information needed to facilitate the preparation of structure rehabilitation plans. This inspection may result in a full investigation including structural analysis to determine member capacity that will be used in a revised load rating. It may be performed independently from a Routine Inspection at intervals other than 24 months. It can be at a longer interval or one time only. Analogous to a Special Inspection for railroad bridges. See 23 CFR 650.305.
46. Inspection – Hands-on. A visual or manual inspection technique made at a distance no greater than arm's length from the entire member or member component surface. Includes examination of all surfaces of the members and member components. May require use of specialized equipment to access members or member components. See 23 CFR 650.305.

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47. Inspection – Initial. Inspection conducted after construction or rehabilitation of a bridge or when the configuration or geometry of the structure changes (examples include, widening, lengthening, and change in vertical clearance). It is the baseline inspection with which all future inspections will be compared. Performance may be coincident with the final construction inspection but must be done by a qualified inspection team. See 23 CFR 650.305.
48. Inspection – Routine. Regularly scheduled inspection consisting of observations and/or measurements needed to determine the physical and functional condition of the bridge, to identify any changes from initial or previously recorded conditions and to ensure that the structure continues to satisfy present service requirements. See 23 CFR 650.305. Analogous to a Periodic Inspection for railroad bridges. See AREMA Manual for Railway Engineering, current edition 2019, updated annually.
49. Inspection – Special. An inspection scheduled at the discretion of the bridge owner, used to monitor a particular known or suspected deficiency. See 23 CFR 650.305. Analogous to an Interim Inspection for railroad bridges. See AREMA Manual for Railway Engineering, current edition 2019, updated annually.
50. Inspection – Underwater. Inspection of the underwater portion of a bridge substructure and the surrounding channel, which cannot be inspected visually at low water by wading or probing, generally requiring diving or other appropriate techniques. See 23 CFR 650.305.
51. Inspection Team Leader. Individual in charge of an inspection team responsible for planning, preparing, and performing field inspection of the bridge. See 23 CFR 650.305, Subpart C and 23 CFR 650.505, Subpart E.
52. Lateral Ground Movement. A permanent offset in the ground induced by seismic movement and usually due to one or more of the collateral hazards. [FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006]
53. Line Management. The unbroken chain of responsibility that extends from the Secretary of Energy to the Deputy Secretary, to the Secretarial Officers who set program policy and plans and develop assigned programs, and to the program and Field Element Managers who are responsible for execution of these programs. [Department of Energy Order 226.1B, Implementation of Department of Energy Oversight Policy, April 25, 2011]
54. Length. The measured opening along the center of the structure between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it includes multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. For vehicular bridges, also known as NBIS Bridge Length. See FHWA-HIF-22-017, SNBI, March 2022.
55. Load and Resistance Factor (LRFD) Design. A design method used by AASHTO, based on limit states of material with increased loads and reduced member capacity based on statistical probabilities. See FHWA Bridge Inspector's Reference Manual (BIRM), FHWA-NHI-23-024, March 2023.
56. Load Rating. The analysis to determine the safe vehicular live load carrying capacity of

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a bridge using bridge plans and supplemented by measurements and other information gathered from an inspection. See 23 CFR 650.305.

57. Operating Rating. Represents the maximum permissible live load that can be placed on the vehicle bridge. Unlimited use by vehicles that subject the bridge to operating levels may shorten the useful life of the bridge. This rating also includes the same load in multiple lanes. Applicable to vehicle bridges.
58. Low Volume Road. A road that is functionally classified as a local or minor collector road and has a design average daily traffic volume of 2,000 vehicles per day or less. [AASHTO Guidelines for Geometric Design of Low-Volume Roads, 2019] A very low-volume local road has a functional classification of local road, and features a design average daily traffic volume of 400 vehicles per day, at most. Functionally classified collectors may also follow these guidelines so long as the design average daily traffic volume does not exceed 400 vehicles per day. [AASHTO, Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400), 2001]
59. Lower Level Earthquake Ground Motion. A small earthquake that has a reasonable probability of occurrence within the life of the bridge (assume 75 years). This ground motion may also be called the frequent earthquake, the expected earthquake (NCHRP 12-49-ATC/MCEER 2003), or the functional evaluation earthquake (Caltrans Seismic Design Methodology (Caltrans 1999). See FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006 and FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006.
60. Management. The safeguarding of the Government's interest in property, in an efficient and economical manner consistent with the best business practices. [41 CFR 102-71.20]
61. National Bridge Inventory (NBI). A database of Structure Inventory and Appraisal data collected by each state or Federal bridge-owning agency to fulfill the requirements of the National Bridge Inspection Standards. See 23 CFR 650.305.
62. National Bridge Inventory Bridge or Reportable 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 includes multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. See 23 CFR Part 650.305, Subpart C.
63. National Bridge Inspection Standards (NBIS). The national standard for the proper safety inspection and evaluation of all highway bridges. See 23 CFR 650.305.
64. National Tunnel Inventory (NTI). A database maintained by the Federal Highway Administration containing inventory and inspection data for all highway tunnels located on public roads, on and off Federal-aid highways.
65. Non-Destructive Testing (NDT). Any of a variety of methods used to assess the strength and condition of materials or structural components of a real property asset that does not

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result in any damage or change to the material or part under examination.

- 66. Nonredundant Steel Tension Member (NSTM). A primary steel member fully or partially in tension, and without load path redundancy, system redundancy or internal redundancy, whose failure may cause a portion of or the entire bridge to collapse. See 23 CFR 650.305.
- 67. Pedestrian Bridge. A structure that carries primarily pedestrian, bicycle, and equestrian traffic but may include light maintenance vehicles over a chasm, waterway, ditch, or other obstacle or convey pedestrian traffic from one building or structure to another including enclosed walkways. It does not include work or machinery platforms, stairways, platforms, boardwalks, or docks or similar type structures.
- 68. Performance-Based Design. A design philosophy that explicitly provides for different levels of bridge performance for earthquakes of different sizes, according to the importance of the asset and its anticipated service life. [FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006]
- 69. Performance Level (PL) or Performance Criteria. A level of performance, expressed in terms of post-earthquake service and damage, expected to be achieved during and immediately following an earthquake of a specified size. See FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006.
- 70. Permit Load. A vehicle or load that exceeds the legal size or weight limits established by each state for operation on state roads. Each state has established procedures for reviewing the safety and serviceability of bridges along the planned route and for providing permission for transit.
- 71. Plan of Corrective Action (PCA). Written plan identifying individual deficiencies or areas where bridge and tunnel management does not comply with Federal or Departmental policy. It describes actions required to correct each deficiency and the schedule for completing each action. [adapted from FHWA memorandum HIBS-30, National Bridge Inspection Standards Plan of Corrective Action(s) Guidelines, January 3, 2017.
- 72. Professional Engineer (PE). An individual, who has fulfilled education and experience requirements and passed examinations for professional engineering and/or structural engineering license that, under State licensure laws, permits the individual to offer engineering services within areas of expertise directly to the public.
- 73. Program Office. A Headquarters organization responsible for executing program management functions, and for assisting and supporting Field Office and Sites in environment, safety and health, administrative, management, and technical areas. [DOE O 430.1C, Real Property Asset Management]
- 74. Program Secretarial Officer (PSO). The head of a Program office which has responsibility for specific facilities, e.g., Environmental Management, Science. [DOE O 430.1C, Real Property Asset Management]
- 75. Prompt Interim Action (PIA). Any action, including repairs, load limits, or partial or full

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bridge closure that is enacted to alleviate a significant safety problem on the bridge. Prompt means as soon as possible or practical given the conditions and consequences of inaction. Interim means that the action may be temporary but is to the extent necessary to ensure safe use of the bridge.

76. Public Access Vehicle Bridge. A structure including supports erected over a depression or an obstruction, such as water, a highway, or a railway, and having a passageway for carrying traffic or other moving loads. A traveler could traverse the structure without ever passing through a staffed entry point or presenting identification. Public access vehicle bridges with a Structure Length of more than 20 feet (6.1 meters) will be included in the National Bridge Inventory unless permanently closed.
77. Public Road. Any road or street under the jurisdiction of and maintained by a public authority and open to public travel. See 23 U.S.C. 101(a)(23).
78. Quality. The condition achieved when an item, service, or process meets or exceeds the user's requirements and expectation. [Code of Federal Regulations 10 CFR Part 830.3]
79. Quality Assurance (QA). All those actions that provide confidence that quality is achieved. [Code of Federal Regulations 10 CFR 830.3] The use of sampling and other measures to assure the adequacy of quality control procedures in order to verify or measure the quality level of the entire bridge inspection and load rating program. [Code of Federal Regulations 23 CFR 650.305, Subpart C].
80. Quality Assurance Program. The overall program or management system established to assign responsibilities and authorities, define policies and requirements, and provide for the performance and assessment of work. [Code of Federal Regulations 10 CFR Part 830.3]
81. Quality Control (QC). Procedures that are intended to maintain the quality of a bridge inspection and load rating at or above a specified level. [Code of Federal Regulations 23 CFR 650.305]
82. Quality Management. The coordination of activities by which an organization identifies its objectives, determines processes and resources to achieve desired results in a timely and cost-effective manner while meeting all technical requirements and addressing both intended and unintended consequences. It includes both Quality Control and Quality Assurance activities. [adapted from International Organization for Standardization (ISO) 9000, Quality Management Systems]
83. Qualified Personnel. Persons performing an inspection or evaluation who meet the qualification requirements specific to the inspection or evaluation being conducted and who understand the duties of the role he or she is expected to perform. Document and submit individual personnel qualifications including appropriate education, experience, licensure, and certifications, and current training, as required.
84. Railroad Bridge. See Code of Federal Regulations 49 CFR 237.5.
85. Real Property Asset. Distinct parcel, building, real property trailer, other structure or

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facility, or interest acquired by or operated for the benefit of the Department of Energy.
[DOE O 430.1C, Real Property Asset Management]

86. Required Strength. Structural capacity needed to meet or exceed the demands put on the structure by the loads.
87. Responsible Engineer. An engineer charged with the overall responsibility for conducting bridge evaluations other than load ratings. This may include scour evaluations, fatigue and fracture evaluations, or seismic evaluations.
88. Scour. Erosion of streambed or bank material or erosion of soil surrounding a bridge foundation due to flowing water. Often the erosion is localized around the bridge piers or abutments. See 23 CFR 650.305.
89. Scour Appraisal. A risk-based and data-driven determination of a bridge's vulnerability to scour, resulting from the least stable result of scour that is either observed, or estimated through a scour evaluation or a scour assessment.
90. Scour Assessment. The determination of an existing bridge's vulnerability to scour which considers stream stability and scour potential as described in HEC 20 and other scour-related data sources.
91. Scour Critical Bridge. A bridge with a foundation that is unstable, or may become unstable, as determined by the scour appraisal.
92. Scour Evaluation. The application of hydraulic analysis as described in HEC 18 and HEC 20 to estimate scour depths and determine bridge and substructure stability considering potential scour.
93. Scour Monitoring Inspection. An inspection performed during or after a triggering storm event as required by a Scour Plan of Action (Scour POA), by personnel with qualifications required by the agency.
94. Scour Plan of Action (Scour POA). Procedures for DOE Site personnel, bridge inspectors, and engineers in managing each bridge determined to be scour critical or that has unknown foundations. The Scour POA should explain why the preferred actions of the procedures were selected, include a scour monitoring plan, possibly a plan for design and construction of countermeasures with a schedule, and a commitment to quarterly progress reporting until corrective actions are satisfied.
95. Seismic Hazard Level (SHL). Used to describe the severity of the seismic and geotechnical hazard at a bridge site for the purpose of detailed evaluation and retrofitting. There are four Seismic Hazard Levels based on the short- and long-period spectral accelerations (S_s and S₁) for the upper level earthquake and corresponding site factors. [FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006]
96. Seismic Hazard Rating (E). Used to describe the severity of the seismic and geotechnical

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- hazard at a bridge site for the purpose of screening and prioritization. The rating is based on the long-period spectral acceleration (S1) for the Upper level Earthquake and the corresponding site factor. Rating range from low (0) to high (10). [FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006]
97. Seismic Retrofitting Category (SRC). Used to recommend minimum screening requirements, evaluation methods and retrofitting measures for deficient bridges. Four categories, A through D, are determined by the anticipated service life, bridge importance, and the seismic and geotechnical hazards at the site. See FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006 and FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006.
98. Service Life. See FHWA-HIF-11042, Bridge Preservation Guide, Spring 2018.
99. Short Span Bridge. A vehicular bridge with a structure length less than 20 feet.
100. Site. A geographic area owned or leased by or for the Federal Government for the performance of DOE program activities. The term includes any buildings, trailers, infrastructure, land, or other improvements. [DOE O 430.1C, Real Property Asset Management]
101. Site Class. Used to classify the location of a bridge according to the properties of the soil as measured by shear wave velocities, blow counts, layer depths and thicknesses. [adapted from FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006]
102. Site Factors. Two site factors, Fa and Fv, are used to account for soil amplification of bedrock ground motions when determining the design response spectrum at the surface. [FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, Jan 2006]
- a. Fa is determined by the site class and the short-period spectral acceleration (Ss) for the upper level earthquake.
 - b. Fv is determined by the site class and the long-period spectral acceleration (S1) for the upper level earthquake.
103. Site and/or Field Office Manager. Individual responsible for planning, programming, budgeting, and evaluation of activities in support of Secretarial office programs located on sites under his/her cognizance.
104. Standard. A document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. [International Organization for Standardization (ISO)] A Standard or Technical Standard includes all of the following:
- a. common and repeated use of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management systems practices;

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- b. the definition of terms; classification of components; delineation of procedures; specification of dimensions, materials, performance, designs, or operations; measurement of quality and quantity in describing materials, processes, products, systems, services, or practices; test methods and sampling procedures; formats for information and communication exchange; or descriptions of fit and measurements of size or strength; and
 - c. terminology, symbols, packaging, marking or labeling requirements as they apply to a product, process, or production method. [Public Law 104-113, National Technology Transfer and Advancement Act of 1995]
105. Strategic Highway Network (STRAHNET). The network of highways, including the Interstate System that provides connecting routes to military installations, industries and resources. It is a subset of the National Highway System and important to the United States' strategic defense policy by providing defense access, continuity and emergency capabilities for defense purposes.
[<https://www.sddc.army.mil/sites/TEA/Functions/SpecialAssistant/Pages/HighwaysNationalDefense.aspx>; <https://www.fhwa.dot.gov/policy/2004cpr/chap18.cfm>]
106. Structure Inventory and Appraisal (SI&A) Data. Data recorded and stored for each bridge as standardized by the Federal Highway Administration to effectively monitor and manage bridge inventory. For data submissions guidelines, see FHWA-HIF-22-017, SNBI, March 2022.
107. Structure Length. The length of roadway, railway, or walkway supported on the structure between undercopings 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. [adapted from Code of Federal Regulations 23 CFR 650.305, Subpart C]
108. Structurally Deficient. A classification given to a bridge with any component, NBI Data Item 58, 59, 60, or 62 (Deck, Superstructure, Substructure, and Culverts, respectively), is in Poor or worse condition (a rating of 4 or less). [Code of Federal Regulations 23 CFR 490.405]
109. Sufficiency Rating. The numerical rating of a bridge based on its structural condition and indicative of its sufficiency to remain in service. [Code of Federal Regulations 23 CFR 650.403]
110. Surface Runoff Event. Occurs on a stream whenever the watershed responds to a precipitation event, rain, hail, sleet, or snow, that causes a stream discharge above base flow. [FHWA-HIF-16-018, HEC No. 17, Highways in the River Environment: Extreme Events, Risk and Resilience, June 2016]
111. Tunnel – Pedestrian. An underground passageway, dug through the surrounding soil/earth/rock and enclosed except for entrance and exit, commonly at each end, and used exclusively for pedestrian or bicycle traffic. It does not include vehicular tunnels that have sidewalks. A tunnel used by both vehicles and pedestrians should be counted in one of the vehicular tunnel categories. A similar tunnel between two buildings may be

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inventoried with one of the buildings.

- 112. Tunnel – Public Access Vehicular. Enclosed roadway for motor vehicle traffic with vehicle access limited to portals, regardless of type of structure or method of construction, and located on a public road. May include lighting, ventilation, fire protection systems, and emergency egress capacity.
- 113. Tunnel – Train. Tunnel used exclusively by trains.
- 114. Tunnel – Controlled Access Vehicular. Enclosed roadway for motor vehicle and pedestrian traffic with vehicle access limited to portals, regardless of type of structure or method of construction. May include lighting, ventilation, fire protection systems, and emergency egress capacity.
- 115. Upper Level Earthquake Ground Motion. A large earthquake that has a finite, but remote, probability of occurrence within the life of the bridge. This ground motion may also be called the rare earthquake, maximum considered earthquake (MCE) (NCHRP 12-49-ATC/MCEER 2003), or the safety evaluation earthquake (Caltrans Seismic Design Methodology (Caltrans 1999). The upper level motion has a 7 percent probability of exceedance in 75 years, which corresponds to a return period of about 1,000 years. See FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, Jan 2006 and FHWA-HRT-06-032, Seismic Retrofitting Manual for Highway Structures, Part 1-Bridges, January 2006.
- 116. Vehicle 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.
 - a. Controlled Access Vehicle Bridge. A vehicle bridge where a traveler must pass through a staffed entry point and present identification to traverse this structure. These structures are not included in the National Bridge Inventory.
 - b. Public Access Vehicle Bridge. A vehicle bridge where a traveler may traverse the structure without ever passing through a staffed entry point or presenting identification. Public access vehicle bridges with a Structure Length of more than 20 feet (6.1 meters) will be included in the National Bridge Inventory unless permanently closed.
- 117. Validation. The process of establishing evidence that provides a high degree of assurance that a product, service, or system accomplishes its intended requirements. [DOE O 430.1C, Real Property Asset Management]
- 118. Voluntary Consensus Standard. A type of standard developed or adopted by voluntary consensus standards bodies, through the use of a voluntary consensus standards development. [OMB Circular A-119, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities, January 27, 2016]

NOTE: Definitions found in current DOE Directives are listed at:

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<https://www.directives.doe.gov/definitions>

ACRONYMS RELATED TO BRIDGE AND TUNNEL MANAGEMENT

AADT	Annual Average Daily Traffic
AADTT	Annual Average Daily Truck Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADCI	Association of Diving Contractors International
ADT	Average Daily Traffic
ADTT	Average Daily Truck Traffic
ANSI/EIA	American National Standards Institute/Electronic Industries Alliance
AREMA	American Railway Engineering and Maintenance-of-Way Association
ASL	Anticipated Service Life
CO	Contracting Officer
CFR	Code of Federal Regulations
CRD	Contractor Requirements Document
DED	Data Element Dictionary
DOE	Department of Energy
DOE BTM	Department of Energy Bridge and Tunnel Manager
E	Seismic Hazard Rating
EO	Executive Order
EV	Emergency Vehicles
FCM	Fracture Critical Member
FHWA	Federal Highway Administration
FIMS	Facilities Information Management System
FRA	Federal Railway Administration
HEC	Hydraulic Engineering Circular
LL	Lower Level
LRFD	Load and Resistance Factor Design
MA-50	Department of Energy, Office of Asset Management
MBE	AASHTO Manual for Bridge Evaluation
MCEER	Multidisciplinary Center for Earthquake Engineering Research
M&O	Management and Operating
NBI	National Bridge Inventory
NBIS	National Bridge Inspection Standards
NDT	Non-Destructive Testing
NHI	National Highway Institute
NHS	National Highway System
NNSA	National Nuclear Security Administration
NTI	National Tunnel Inventory
OMB	Office of Management and Budget

ACRONYMS RELATED TO BRIDGE AND TUNNEL MANAGEMENT

OSF	Other Structures and Facilities
PCA	Plan of Corrective Action
PL	Performance Level
POA	Plan of Action
PSO	Program Secretarial Officer
QA	Quality Assurance
QC	Quality Control
SHL	Seismic Hazard Level
SHV	Specialized Hauling Vehicles
SI&A	Structure Inventory and Appraisal
SNBIBE	Specification for the National Bridge Inventory Bridge Elements
SRC	Seismic Retrofit Category
TOMIE	Tunnel Operations, Maintenance, Inspection, and Evaluation
UL	Upper Level